This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

44. 427.

A KEY

TO THE FIRST PART OF

MOLINEUX'S

PRACTICAL ARITHMETIC;

CONTAINING

SOLUTIONS OF ALL THE QUESTIONS,

AT FULL LENGTH,

WITH REMARKS.

BY JOSEPH HALL,

TEACHER OF MATHEMATICS.

LONDON:
LONGMAN, BROWN, GREEN, AND LONGMANS, PATERNOSTER-ROW;
AND J. WRIGHT, MACCLESFIELD.

1844.

BIBLIOTHECA · BODLEIANA ·
DOMINUS ILLUMINATIO MEA

PREFACE.

The Author of this Key has followed the plan of Mr. Molineux as much as possible, in the solution of the Questions, though there is a little deviation as respects Division. If, for instance, the divisor is 12, and the remainder 6, the remainder is written in a parenthesis, thus, (6) not ½. When the learner sees ½, he supposes he is not right, though the quotient figures are all correct, and, on this account, additional trouble is given to the teacher to explain it.

In working the Examples, belonging to Weights and Measures, in the Rule of Practice, the farthings only are brought out, and the remainders set opposite the line without further trouble. Examples 189, 190, in Practice, properly belong to the Rule-of-Three, for it is not possible to give the *exact* solution of them, without employing both Addition and Division of Vulgar Fractions, which are not treated of in the First Part of the Arithmetic.

No person can doubt the excellency of Molineux's Arithmetic as a Standard School Book. It has, for a great number of years, been used in many respectable Schools in the kingdom, and, it is presumed, the present Key will render it still more acceptable, by lessening the labour of the Teacher.

The Solutions in this Key, belong to the Questions as they stand in the new corrected Edition of the Arithmetic.

J. H.

MACCLESFIELD,
Nov., 1843.

A KEY

TO THE FIRST PART OF

MOLINEUX'S

PRACTICAL ARITHMETIC.

ADDITION.

1	34	22	37777	43	5094174
2	41	23	26212	44	37545466
3	258	24	18145	45	20864218
4	314	25	16293	46	364973820
5	270	26	433060	47	256539731
6	407	27	155470	48	260209400
7	2575	28	264428	49	248160988
8	2186	29	124441	50	176861869
9	3667	30	134041	51	31360869
10	2752	31	220339	52	199840506
11	3035	32	3176513	53	333540299
12	1749	33	4014922	54	547402022
13	23480	34	1648966	55	377836397
14	13389	35	4673970	56	50759361
15	35005	36	2502539	57	203608627
16	24466	37	1747372	58	5700742404
17	34026	38	3235335	59	4852389026
18	30977	39	2533394	60	197452534
19	24842	40	11542674	61	83288220
20	34296	41	10569758	62	29861068878
21	21309	42	9172259	63	54076212965

⁎ It is considered unnecessary to give the Answers to the Examples in Numeration, Notation, and Subtraction.

MULTIPLICATION.

1. 372 459
2
744 918

2. 168 372
3
505 116

3. 861 825
4
3 447 300

4. 734 692
5
3 673 460

5. 7 133 864
6
42 803 184

6. 870 046
7
6 090 322

7. 362 791
8
2 902 328

8. 4 967 583
9
44 708 247

9. 7 299 548
10
72 995 480

10. 8 472 539
11
93 197 929

11. 4 927 836
12
59 134 032

12. 4 316 783
2
8 633 566

13. 21 703 585
3
65 110 755

14. 4 651 739
4
18 606 956

15. 3 679 540
5
18 397 700

16. 80 273 645
6
481 641 870

17. 76 197 824
7
533 384 768

18. 29 384 657
8
235 077 256

19. 69 443 578
9
624 992 202

20. 31 827 949
11
350 107 439

21. 8 720 469 534
12
104 645 634 408

22.
873 627 14
10
873 627 140

23.
513 582 97
30
1 540 748 910

24.
1 357 975 3
100
1 357 975 300

25.
6 017 475 8
500
30 087 379 000

26.
136 462 40
40
545 849 600

27.
8 295 600 0
900
74 660 400 000

28.
588 504 63
110
6 473 550 930

29.
419 734 81
80
3 357 878 480

30.
7 423 000
6 000
44 538 000 000

31.
263 407 9
1 200
3 160 894 800

32.
4 073 292
2 000
8 146 584 000

33.
34 567 870
1000
34 567 870 000

34.
.3 265 431
13
42 450 603

35.
.3 292 734
14
46 098 276

36.
.7 126 059
15
106 890 885

37.
.3 261 735
16
52 187 760

38.
.1 040 016
18
18 720 288

39.
.9 348 273
17
158 920 641

40.
.2 996 397
19
56 931 543

41.
..1 208 914
115
139 025 110

42.
.12 345 679
18
222 222 222

43.
..10 188 938
113
1 151 349 994

44.
.3 312 671
26
86 129 446

45.
.1 302 440
34
44 282 960

46.
.20 030 59
870
1 742 661 330

47.
.. 664 454
104
69 103 216

48.
..4 282 902
107
458 270 514

49.
... 450 372
1 002
451 272 744

50.
672 324
211
141 860 364

51.
3 453 87
710
245 224 770

52.
47 391 526 × 14
7
331 740 682
2
663 481 364

53.
38 562 047 × 15
5
192 810 235
3
578 430 705

54.
78 610 094 × 16
4
314 440 376
4
1 257 761 504

55.
19 993 779 × 22
11
219 931 569
2
439 863 138

56.
13 647 283 × 25
5
68 236 415
5
341 182 075

57.
32 844 679 × 27
9
295 602 111
3
886 806 333

58.
96 217 865 × 32
8
769 742 920
4
3 078 971 680

59.
27 458 393 × 35
7
192 208 751
5
961 043 755

60.
37 456 982 × 42
7
262 198 874
6
1 573 193 244

61.
73 867 921 × 45
9
664 811 289
5
3 324 056 445

62.
34 917 897 × 49
7
244 425 279
7
1 710 976 953

63.
7397896 × 540
9
66581064
6
3994863840

64.
6224971 × 550
11
68474681
5
3423734050

65.
42 679 523 × 56
8
341 436 184
7
2 390 053 288

66.
80 389 273 × 63
9
723 503 457
7
5 064 524 199

67.
52 450 386 × 66
11
576 954 246
6
3 461 725 476

68.
3617856 × 720
9
32560704
8
2604856320

69.
3916479 × 840
12
46997748
7
3289842360

70.

$$\begin{array}{r} 62\,143\,183 \times 88 \\ 11 \\ \hline 683\,575\,013 \\ 8 \\ \hline 5\,468\,600\,104 \\ \hline\hline \end{array}$$

71.

$$\begin{array}{r} 76\,100\,734 \times 96 \\ 12 \\ \hline 913\,208\,808 \\ 8 \\ \hline 7\,305\,670\,464 \\ \hline\hline \end{array}$$

72.

$$\begin{array}{r} 7453621 \times 1080 \\ 12 \\ \hline 89443452 \\ 9 \\ \hline 8049910680 \\ \hline\hline \end{array}$$

73.

$$\begin{array}{r} 56\,419\,273 \times 121 \\ 11 \\ \hline 620\,612\,003 \\ 11 \\ \hline 6\,826\,732\,033 \\ \hline\hline \end{array}$$

74.

$$\begin{array}{r} 46301820 \times 13200 \\ 12 \\ \hline 55562184 \\ 11 \\ \hline 611184024000 \\ \hline\hline \end{array}$$

75.

$$\begin{array}{r} 92\,860\,294 \times 144 \\ 12 \\ \hline 1\,114\,323\,528 \\ 12 \\ \hline 13\,371\,882\,336 \\ \hline\hline \end{array}$$

76.

$$\begin{array}{r} 6\,492\,538 \\ 13 \\ \hline 19\,477\,614 \\ 64\,925\,38 \\ \hline 84\,402\,994 \\ \hline\hline \end{array}$$

77.

$$\begin{array}{r} 9\,012\,836 \\ 19 \\ \hline 81\,115\,524 \\ 90\,128\,36 \\ \hline 171\,243\,884 \\ \hline\hline \end{array}$$

78.

$$\begin{array}{r} 1\,723\,896 \\ 26 \\ \hline 10\,343\,376 \\ 34\,477\,92 \\ \hline 44\,821\,296 \\ \hline\hline \end{array}$$

79.

$$\begin{array}{r} 3\,198\,724 \\ 31 \\ \hline 3\,198\,724 \\ 95\,961\,72 \\ \hline 99\,160\,444 \\ \hline\hline \end{array}$$

80.

$$\begin{array}{r} 4742693 \\ 370 \\ \hline 33198851 \\ 14228079 \\ \hline 1754796410 \\ \hline \end{array}$$

81.

$$\begin{array}{r} 2\,173\,749 \\ 46 \\ \hline 13\,042\,494 \\ 86\,949\,96 \\ \hline 99\,992\,454 \\ \hline \end{array}$$

82.

$$\begin{array}{r} 7\,834\,276 \\ 58 \\ \hline 62\,674\,208 \\ 391\,713\,80 \\ \hline 454\,388\,008 \\ \hline \end{array}$$

83.

$$\begin{array}{r} 3891207 \\ 690 \\ \hline 35020863 \\ 23347242 \\ \hline 2684932830 \\ \hline \end{array}$$

84.

$$\begin{array}{r} 2\,971\,826 \\ 74 \\ \hline 11\,887\,304 \\ 208\,027\,82 \\ \hline 219\,915\,124 \\ \hline \end{array}$$

85.

$$\begin{array}{r} 5\,629\,137 \\ 82 \\ \hline 11\,258\,274 \\ 450\,330\,96 \\ \hline 461\,589\,234 \\ \hline \end{array}$$

86.

$$\begin{array}{r} 62\,874\,379 \\ 95 \\ \hline 314\,371\,895 \\ 5\,658\,694\,11 \\ \hline 5\,973\,066\,005 \\ \hline \end{array}$$

87.

$$\begin{array}{r} 323\,749 \\ 807 \\ \hline 2\,266\,243 \\ 258\,999\,2 \\ \hline 261\,265\,443 \\ \hline \end{array}$$

88.

$$\begin{array}{r} 960\,253\,478 \\ 231 \\ \hline 960\,253\,478 \\ 28\,807\,604\,34 \\ 192\,050\,695\,6 \\ \hline 221\,818\,553\,418 \\ \hline \end{array}$$

89.

$$\begin{array}{r} 201673439 \\ 3720 \\ \hline 403346878 \\ 1411714073 \\ 605020317 \\ \hline 750225193080 \\ \hline \end{array}$$

90.
761 283 459
5 074

3 045 133 836
53 289 842 13
3 806 417 295

3 862 752 270 966

91.
516 400 328
6 509

4 647 602 952
258 200 164 0
3 098 401 968

3 361 249 734 952

92.
834 630 517
727

5 842 413 619
16 692 610 34
584 241 361 9

606 776 385 859

93.
46 538 273
80 903

139 614 819
41 884 445 7
3 723 061 84

3 765 085 900 519

94.
190 735 628
2 345

953 678 140
7 629 425 12
57 220 688 4
381 471 256

447 275 047 660

95.
728 395 642
7 943

2 185 186 926
29 135 825 68
655 556 077 8
5 098 769 494

5 785 646 584 406

96.
386 015 766
84 065

1 930 078 830
23 160 945 96
1 544 063 064
30 881 261 28

32 450 415 368 790

97.
23546007
755080

188368056
117730035
117730035
164822049

17779118965560

98.
467 301 708
730 201

467 301 708
93 460 341 6
14 019 051 24
327 111 195 6

341 224 174 483 308

99.
229568400
94073

6887052
16069788
9182736
20661156

21596188093200

100.
3287652000
8416500

16438260
19725912
3287652
13150608
26301216

27670523058000000

101.
2 861 997 683
382 074

11 447 990 732
200 339 837 81
5 723 995 366
228 959 814 64
858 599 304 9

1 093 494 902 734 542

102.
6431872300
914620000

128637446
385912338
257274892
64318723
578868507

5882719043026000000

103.
1 368 172 438
10 390 027

9 577 207 066
27 363 448 76
123 135 519 42
410 451 731 4
13 681 724 38

14 215 348 571 475 826

104.
5 710 364 821
723 856

34 262 188 926
285 518 241 05
4 568 291 856 8
17 131 094 463
114 207 296 42
3 997 255 374 7

4 133 481 837 869 776

105.
7 314 671 810
193 006 57

51 202 702 67
365 733 590 5
4 388 803 086
2 194 401 543
65 832 046 29
73 146 718 1

141 177 971 672 379 170

106.
2 184 806 003
7 140 862

4 369 612 006
131 088 360 18
1 747 844 802 4
87 392 240 12
218 480 600 3
15 293 642 021

15 601 398 164 194 586

107.
4938165203
6659380

39505321624
14814495609
44443486827
24690826015
29628991218
29628991218

32885118589554140

108.
21 983 164 213
8 274 386

131 898 985 278
1 758 653 137 04
6 594 949 263 9
87 932 656 852
1 538 821 494 91
4 396 632 842 6
175 865 313 704

181 897 186 199 748 218

109.
35 206 328 000
210 508 367

246 444 296
2 112 379 68
10 561 898 4
281 650 624
17 603 164 0
352 063 28
7 041 265 6

7 411 226 615 346 376 000

110.
51964463700
3806475900

4676801733
2598223185
3637512459
2078578548
3117867822
4157157096
1558933911

197801478730474830000

111.
4 687 312 217
15 830 467

32 811 185 519
281 238 733 02
1 874 924 886 8
140 619 366 51
3 749 849 773 6
23 436 561 085
46 873 122 17

74 202 341 369 915 339

112.
43 218 468 214
813 450 186

259 310 809 284
3 457 477 457 12
4 321 846 821 4
2 160 923 410 70
17 287 387 285 6
129 655 404 642
432 184 682 14
34 574 774 571 2

35 156 071 007 313 387 804

113.
81 439 564 812
8 920 703 816

488 637 388 872
814 395 648 12
65 151 651 849 6
244 318 694 436
57 007 695 868 4
1 628 791 296 24
73 295 608 330 8
651 516 518 496

726 498 236 591 787 722 592

114.
321 827 645 782
9 700 230 105

1 609 138 228 910
32 182 764 578 2
9 654 829 373 46
64 365 529 156 4
225 279 352 047 4
2 896 448 812 038

3 121 802 218 235 832 667 110

115.
842 958 794 231
371 486 592

1 685 917 588 462
75 866 291 480 79
421 479 397 115 5
5 057 752 765 386
67 436 703 538 48
337 183 517 692 4
842 958 794 231
59 007 115 596 17
252 887 638 269 3

313 147 889 665 303 450 752

116.
2 143 271
62

4 286 542 Product by 2
128 596 260 —— 60

132 882 802 —— 62

117.
3 748 796
147

26 241 572 Prod. by 7
524 831 440 —— 140

551 073 012 —— 147

118.
1 041 546
26

20 830 920 Prod. by 20
6 249 276 —— 6

27 080 196 —— 26

119.
2 166 085
153

6 498 255 Prod. by 3
324 912 750 —— 150

331 411 005 —— 153

120. 3571058
2117

24997406 Prod. by 7
35710580 —— 10
7499221800 —— 2100

7559929786 —— 2117

121. 2480246
32424

74407380000 Prod by 30000
5952590400 —— 2400
59525904 —— 24

80419496304 —— 32424

122. 66179380
53515

330896900000 Prod. by 50000
99269070 —— 15
23162783000 —— 3500

3541589520700 —— 53515

123. 30145900
246582

602918 Prod. by 2
24116720 —— 80
150729500 —— 500
1808754000 —— 6000
72350160000 —— 240000

7433436313800 —— 246582

124. 13713357
903364

54853428 Prod. by 4
4936808520 —— 360
41140071000 —— 3000
12342021300000 —— 900000

12388153032948 —— 903364

125. 38690494
1681284

46428592800 Prod. by 1200
3250001496 —— 84
65000029920000 —— 1680000

65049708514296 —— 1681284

126. 20635441
3367359

61906323000000 Prod. by 3000000
185718969 —— 9
7428758760000 —— 360000
144448087000 —— 7000
7222404350 —— 350

69486937970319 —— 3367359

127.
837856 × 999
837856000 Prod. by 1000
837856 Deduct
837018144 Prod. by 999

128.
615634 × 99999
61563400000 Prod. by 10000
615634 Deduct
61562784366 Prod by 99999

129.
38575 × 1111
385750000 Prod. by 10000
38575 Deduct
9) 385711425 Prod. by 9999
42856825 —— 1111

130.
6084872 × 2222
60848720000 Prod. by 10000
6084872 Deduct
9) 60842635128 Prod. by 9999
6760292792 —— 1111
2
13520585584 —— 2222

131.
151277 × 55555
15127700000 Prod. by 100000
151277 Deduct
9) 15127548723 Prod. by 99999
1680838747 —— 11111
5
8404193735 —— 55555

132.
587903 × 3333
5879030000 Prod. by 10000
587903 Deduct
3) 5878442097 Prod. by 9999
1959480699 —— 3333

133.
481027 × 6666
4810270000 Prod. by 10000
481027 Deduct
3) 4809788973 Prod. by 9999
1603262991 —— 3333
2
3206525982 —— 6666

134.
346215 × 9998
3462150000 Prod. by 10000
692430 Twice 346215 Deduct
3461457570 Prod. by 9998

135.
786345 × 996
786345000 Prod. by 1000
3145380 Four times 786345 Deduct
783199620 Prod. by 996

136.
4867339 × 5
2) 48673390 Product by 10
24336695 ——— 5

137.
36457047 × 25
4) 3645704700 Prod. by 100
911426175 ——— 25

138.
2634559 × 175
263455900 Prod. by 100
131727950 ——— 50
65863975 ——— 25
461047825 ——— 175

139.
473935 × 75
4) 47393500 Prod. by 100
11848375 ——— 25 Deduct
35545125 ——— 75

⁂ The last eleven Examples have more of ingenuity about them than utility. The 130th., 131st., and 133rd. Examples require more figures than the common way.

DIVISION.

In working the Examples in Simple Division, the remainder and divisor are not written in a fractional form, but the remainder is merely expressed in a parenthesis, after the integral part of the quotient.

1.
2) 462834
231417

2.
3) 634779
211593

3.
4) 4859701
1214925 (1)

4.
5) 2903473
580694 (3)

5.
6) 458010
76335

6.
7) 216157
30879 (4)

7.
8) 943842
117980 (2)

8.
9) 8047813
894201 (4)

9.
11) 4925846
447804 (2)

10.
12) 6389724
532477

11.
2) 2796834
1398417

12.
3) 5817617
1939205 (2)

13.
4) 7562700
1890675

14.
5) 3647872
729574 (2)

15.
6) 9112875
1518812 (3)

16.
7) 7980693
1140099

17.
8) 2945277
368159 (5)

18.
9) 43054681
4783853 (4)

19.
11) 81007037
7364276 (1)

20.
12) 83150071
6929172 (7)

---

21. 2,0) 394118,7
197059 (7)

22. 1,0) 272645,3
272645 (3)

23. 5,0) 210273,5
42054 (35)

24. 3,00) 74112,82
24704 (82)

25. 7,00) 30621,66
4374 (366)

26. 4,0) 452767,0
113191 (30)

27. 1,00) 19307,01
19307 (1)

28. 11,00) 28190,30
2562 (830)

29. 9,000) 1393,055
154 (7055)

30. 12,0) 1272520,0
106043 (40)

31. 6,00) 52440,03
8740 (3)

32. 1,000) 23133,000
23133

33. 3) 95163765
5) 31721255
6344251

34. 4) 60873136
4) 15218284
3804571

35. 3) 85967213—2
7) 28655737—5
4093676 (17)

36. 2) 20017665—1
11) 10008832—9
909893 (19

37. 4) 24279564—0
6) 6069891—3
1011648 (12)

38. 5) 43980164—4
5) 8796032—2
1759206 (14)

39. 3) 147930842—2
9) 49310280—0
5478920 (2)

40. 6) 18256944—0
6) 3042824—2
507137 (12)

41. 5) 482859585
9) 96571917
10730213

42. 6) 38494756—4
8) 6415792—0
801974 (4)

43. 5) 94503820—0
11) 18900764—3
1718251 (15)

44. 63,0 { 7) 84856316,7—6
9) 12122330 —5
1346925 (417)

45.
64,0 { 8) 20254087,3—7
8) 2531760 —0 }
316470 (73)

46.
6) 453978348—0
11) 75663058—9 }
6878459 (54)

47.
72,0 { 8) 391401384,8—0
9) 48925173 —3 }
5436130 (248)

48.
9) 603561462—6
9) 67062384—0 }
7451376 (6)

49.
7) 472897046—6
12) 67556720—8 }
5629726 (62)

50.
8) 402375809—1
11) 50296976—4 }
4572452 (33)

51.
8) 7932542791—7
12) 991567848—0 }
82630654 (7)

52.
9) 4238711306—8
11) 470967922—7 }
42815265 (71)

53.
108,00 { 9) 4856147316,09
12) 539571924
44964327 (9)

54.
11) 6752038477—8
11) 613821679—9 }
55801970 (107)

55.
11) 5714293849—0
12) 519481259—11
43290104 (121)

56.
12) 9837492480
12) 819791040
68315920

LONG DIVISION.

57\.
13)15873(1221
13
28
26
27
26
13
13
0

58\.
17)40188(2364
34
61
51
108
102
68
68
0

59\.
23)81587(3547
69
125
115
108
92
167
161
6

60\.
37)854219(23087
74
114
111
321
296
259
259
0

61\.
43)2700862(62810
258
120
86
348
344
46
43
32

62\.
59)3136558(53162
295
186
177
95
59
365
354
118
118
0

63.

```
65)907874(13967
   65
   ---
   257
   195
   ---
    628
    585
    ---
     437
     390
     ---
      474
      455
      ---
       19
```

64.

```
78,0)31490039,1(403718
     312
     ---
      290
      234
      ---
       560
       546
       ---
        143
         78
        ---
         659
         624
         ---
          351
```

65.

```
87)4770123(54829
   435
   ---
    420
    348
    ---
     721
     696
     ---
      252
      174
      ---
       783
       783
       ---
         0
```

66.

```
95)96095350(1011530
   95
   ---
    109
     95
    ---
     145
      95
     ---
      503
      475
      ---
       285
       285
       ---
         0
```

67.

```
74,00)981647,80(13265
      74
      ---
      241
      222
      ---
       196
       148
       ---
        484
        444
        ---
         407
         370
         ---
         3780
```

68.

318)134142894(421833
1272
694
636
582
318
2648
2544
1049
954
954
954
0

69.

537,0)1764532490,5(3285907
1611
1535
1074
4613
4296
3172
2685
4874
4833
4190
3759
4315

70.

744)4315222514184(5800030261
3720
5952
5952
····2251
2232
1941
1488
4538
4464
744
744
0

71.

4295,000)1044346430,057(243154
8590
18534
17180
13546
12885
6614
4295
23193
21475
17180
17180
57

72.

60183)7791471800(129463
60183

177317
120366

569511
541647

278648
240732

379160
361098

180620
180549

71

73.

7923)66158428602(8350174
63384

27744
23769

39752
39615

13786
7923

58630
55461

31692
31692

0

74.

37026)268081496399(7240358
259182

88994
74052

149429
148104

132563
111078

214859
185130

297299
296208

1091

75.

6132,00)503370577049,00)82089135
49056

12810
12264

54657
49056

56017
55188

8290
6132

21584
18396

31889
30660

1229

76.

```
59417(7320620266000(123207504
      59417
      ------
      137892
      118834
      -------
       190580
       178251
        -------
        123292
        118834
        --------
          445866
          415919
          --------
           299470
           297085
           --------
             238500
             237668
             --------
                832
             ========
```

77.

```
73629(1280854059966(17396054
      73629
      ------
      544564
      515403
      -------
       291610
       220887
       -------
        707235
        662661
        --------
         445749
         441774
         --------
           397596
           368145
           --------
            294516
            294516
            --------
                .0
           =========
```

78.

```
80275)1697552145250(21146710
      160550
      -------
        92052
        80275
        ------
        117771
         80275
         ------
         374964
         321100
         -------
          538645
          481650
          -------
           569952
           561925
           -------
             80275
             80275
           -------
                 0
          ========
```

79.

```
270173)14786308383574(54729038
       1350865
       --------
        1277658
        1080692
        --------
         1969663
         1891211
         --------
           784528
           540346
           --------
           2441823
           2431557
            --------
            1026657
             810519
             --------
             2161384
             2161384
             --------
                   0
             ========
```

80.

661872,0)6445923089753,3(9738926
5956848

4890750
4633104

2576468
1985616

5908529
5294976

6135537
5956848

1786895
1323744

4631513
3971232

6602813

81.

9473506)72277526669699(7629438
66314542

59629846
56841036

27888106
18947012

89410949
85261554

41493956
37894024

35999329
28420518

75788119
75788048

71

82. 73800496) 3484094183776976 (47209631
295201984
532074343
516603472
154708717
147600992
710772576
664204464
465681129
442802976
228781537
221401488
73800496
73800496
0

83. 47392518) 183486891373104210 (3871642595
142177554
413093373
379140144
339532297
331747626
77846713
47392518
304541951
284355108
201868430
189570072
122983584
94785036
281985482
236962590
450228921
426532662
236962590
236962590
0

84. 92730586) 61111656251663731 28 (65902372548
556383516
547330465
463652930
836775351
834575274
220007766
185461172
345465943
278191758
672741857
649114102
236277553
185461172
508163811
463652930
445108812
370922344
741864688
741844688
20000

TABLE OF MULTIPLES OF THE DIVISOR.

1.	92730586
2.	185461172
3.	278191758
4.	370922344
5.	463652930
6.	556383516
7.	649114102
8.	741844688
9.	834575274

85. 13) 157859(12143
27
18
55
39
0

86. 34) 731816(21524
51
178
81
136
0

87. 57) 29814483(523061
131
174
348
63
6 rem.

88. 437) 6746525(15438
2376
1915
1672
3615
119 rem.

89.

216) 652735800 (3021925
473
415
1998
540
1080
0

90.

6251,00) 1223714516,71 (1957
59861
36024
47695
39381
18756
371 rem.

91.

7062) 33149155216 (4694018
49011
66395
28375
12721
56596
100 rem.

92.

30094,0)1953733478420,0(6492103
148093
277174
63287
30998
90442
1600 rem.

93.

8½ 48634565
2 2

17) 97269130 (5721713
122
36
29
121
23
60
9 rem.

94.

30¼ 765867564
4 4

121 11) 3063470256

11) 278497296

25317936

95.

7½ 173548
4 4

3,0) 69419,2

23139 (22)

96.

73⅝ 16442524
8 8

589) 131540192 (223328
1374
1960
1931
1649
4712
0

The Answers to the six following Questions are not given in the small Key.

1.

```
23017 ) 267000005 ( 11600
        23017
        -----
         36830
         23017
         ------
         138130
         138102
         ------
           2805 rem.
         ======
```

2.

```
219561 ) 2000000584017 ( 9109088
          1976049
          -------
           239515
           219561
           -------
            1995484
            1976049
            -------
             1943501
             1756488
             -------
              1870137
              1756488
              -------
               113649 rem.
              =======
```

3.

```
   23
   23
  ---
   46
   10
  ---
   56 divisor
   23 quotient
  ---
  168
 112
   23 rem. add
  ---
 1311 dividend. Ans.
 ====
```

4.

```
11) 14641
     1331
    -----
11) 13310 At the end of 3rd. year.
     1210
    -----
11) 12100 At the end of 2nd. year.
     1100
    -----
11) 11000 At the end of 1st. year.
     1000
    -----
    10000 At beginning of 1st year.
    =====
```

5.

```
 7911¾     95000000
    4             4
------    ---------   Diam.   Miles
31647    ) 380000000 ( 12007 & 3617¾ Ans.
           31647
           -----
            63530
            63294
            ------
              236000
              221529
              ------
          4)   14471
              ------
               3617¾ miles, rem.
              ======
```

6.

```
      1,0 ) 9500000,0
            ---------
            9500000   hours.

8766 ) 9500000 ( 1083 years. Ans.
       8766
       -----
        73400
        70128
        -----
         32720
         26298
         -----
          6422
         =====
```

REDUCTION.

MONEY.

1.
£.
13
20
260 *shillings.*

2.
s.
25
12
300 *pence.*

3.
s.
2,0) 34,0
£17

4.
d.
43
4
172 *far.*

5.
d.
12) 628—4
52*s.* 4*d.*

6.
far.
4) 35—3
8¼*d.*

7.
s.
2,0) 177,0—10
£88 10*s.*

8.
£. *s.*
73 7
20
1467 *shil.*

9.
d.
14½
4
58 *far.*

10.
d.
12)203—11
16*s.* 11*d.*

11.
s. *d.*
391 9
12
4701 *pence.*

12.
s.
2,0) 561,1—11
£280 11*s.*

13.
£. *s.*
47 13
20
953 *shil.*

14.
£.
37
20
740 *shil.*
12
8880 *pence.*

15.
£. *s.* *d.*
8 15 6
20
175 *shil.*
12
2106 *pence.*

16.
£. *s.*
100 13
20
2013 *shil.*

17.
d.
12) 1731—3
2,0) 14,4—4
£7 4*s.* 3*d.*

18.
d.
12) 51128—8
2,0) 426,0—0
£213 0*s.* 8*d.*

19.
£. s. d.
54 . 0 . 3
20

1080 *shil.*
12

12963 *pence.*
4

51852 *far.*

20.
Far.
4) 25155—3

12) 6288—0

2,0) 52,4—4

£26 . 4 . 0¾

21.
£. s. d.
63 . 12 . 4¼
20

1272 *shillings.*
12

15268 *pence.*
4

61073 *farthings*

22.
£. s. d.
32 . 10 . 11½
20

650 *shillings.*
12

7811 *pence.*
4

31246 *farthings.*

23.
Far.
4) 2083081—1

12) 520770—6

2,0) 4339,7—17

£2169 . 17 . 6¼

24.
£ s. d.
734 . 19 . 0¼
20

14699 *shillings.*
12

176388 *pence.*
4

705553 *farthings.*

TROY WEIGHT.

25.
lb.
78
12

936 *ounces.*

26.
dwt.
93
6

558
4

2232 *grains.*

27.
oz. dwt.
6 2
20

122 *dwt.*

28. *lbs.*
301
12
3612 *oz.*
20
72240 *dwt.*

29. *oz.*
12) 290—2
24*lbs.* 2*oz.*

30. *lb.* *oz.* *dwt.*
141 . 0 . 11
12
1692 *oz.*
20
33851 *dwt.*

31. *dwt.*
2,0) 27,7—17
13*oz.* 17*dwt.*

32. *dwt.* *gr.*
7 . 22
6
42
4
190 *gr.*

33. *dwt.*
2,0) 7584,0
12) 3792
316 *lb.*

34. *lb.* *oz.* *dwt.* *gr.*
250 . 11 . 0 . 16
12
3011 *oz.*
20
60220 *dwt.*
6
361320
4
1445296 *gr.*

35. *dwt.*
2,0) 4506,2—2
12) 2253—9
187*lb* 9*oz.* 2*dwt.*

36. *gr.*
4) 482145 2—0 } 20
6) 120536 3—5 }
2,0) 20089,3—13
12) 10044 —0
837*lb.* 0*oz.* 13*dwt* 20*gr.*

AVOIRDUPOIS WEIGHT.

37.
cwt.
93
4
372 *qrs.*

38.
oz.
4) 7312
4) 1828
457 *lb.*

39.
qrs.
823
7
5761
4
23044 *lb.*

40.
cwt.
2,0) 133,4—14
66*t.* 14*cwt.*

41.
cwt. *qr.* *lb.*
28 . 1 . 6
4
113 *qrs.*
7
791
4
3170 *lb.*

42.
dr.
4) 68448
4) 17112
4) 4278—2 } 6
4) 1069—1 }
267 *lb.* 6*oz.*

43.
lbs.
4) 95088
7) 23772
4) 3396
849 *cwt.*

44.
T. *cwt.* *qr.* *lb.*
7 . 12 . 3 . 0
20
152 *cwt.*
4
611 *qrs.*
7
4277
4
17108 *lbs.*

45.
lb. *oz.*
104 . 3
4
416
4
1667 *oz.*
4
6668
4
26672 *dr.*

46.
dr.
4) 9127—3 } 7
4) 2281—1 }
4) 570—2 } 18
6) 142—4 }
23*gt.lb.* 18*oz.* 7*dr.*

47.
lbs.
4 10422—2 } 6
7) 2605—1 }
4) 372—0
2,0) 9,3—13
4*t.* 13*cwt.* 0*qr.* 6*lb.*

48.
cwt. *qr.* *lb.*
32 . 0 . 21
32
32
3221
3605 *lb.*

APOTHECARIES WEIGHT.

49. *lb.*
108
12
1296 *oz.*
8
10368 *dr.*

50. *gr.*
2,0) 8094,0
3) 4047 *scr.*
1349 *dr.*

51. *dr.* *scr.*
37 . 2
3
113 *scr.*

52. *dr.*
8) 1115—3
139 *oz.* 3 *dr.*

53. *oz.*
12) 359—11
29 *lb.* 11 *oz.*

54. *lb.* *oz.* *dr.* *scr.* *gr.*
32 . 10 . 3 . 1 . 14
12
394 *oz.*
8
3155 *dr.*
3
9466 *scr.*
20
189334 *gr.*

CLOTH MEASURE.

55. *yd.* *qr.*
8 . 3
4
35 *qr.*

56. *E. e.*
11
5
55 *qr.*

57. *qr.*
3) 1308
436 *Fl. e.*

58. *nl.*
4) 732
183 *qr.*

59. *yd.*
79
4
316 *qr.*
4
1264 *nl.*

60. *Fl. e.* *qr.*
63 . 1
3
190 *qr.*

61. *yd. qr. nl.*
19 . 2 . 3
4
78 *qr.*
4
315 *nl.*

62. *nl.*
4) 748
5) 187—2
37 *E. e.* 2*qr.*

63. *nl.*
4) 423—3
4) 105—1
26*yd.* 1*qr.* 3*nl.*

64. *qr. nl.*
292 . 2
4
1170 *nl.*

65. *Fr. e. qr. nl.*
21 . 0 . 2
6
126 *qr.*
4
506 *nl.*

66.
nl.
4) 2101—1
3) 525—0
175 *Fl. e.* 0 . 1*nl.*

LONG MEASURE.

67. *yd.*
79
3
237 *feet.*

68. *ft.*
294
12
3528 *inches.*

69.
Fur.
8) 2310
288 *m.* 6 *fur.*

70. *Fur. pl.*
121 . 10
40
4850 *poles.*

71. *Pl.*
58
11
2) 638
319 *yards*

72. *Pl.*
99
2
11) 198
18 *poles.*

73.
Yd.
73
2
11) 146—3 or 1½ yd.
13 *pl.* 1½ *yd.*

74.
Pl.
311
11
2) 3421—1 or ½ yd.
1710½ *yards.*

75. *yd. ft. in.*
12 . 1 . 7
3
37 *ft.*
12
451 *in.*

76. *ml. fur. pl.*
4 . 0 . 20
8
32 *fur.*
40
1300 *pl.*

77. *ml. yd.*
7835 . 246
1760
470346
54845
7835
13789846 *yd.*

78. *M. yd.*
176,0) 157359,3 (894 . 153
1655
719
153 rem.

LAND MEASURE.

79. *acr. rd.*
27 . 3
4
111 *rd.*

80. *p.*
4,0) 83,1—31
20 *rd.* 31 *pl.*

81 *acr.*
31
4
124 *rd.*
40
4960 *p.*

82. *acr. rd. p.*
15 . 2 . 38
4
62 *rd.*
40
2518 *p.*

83. *p.*
4,0) 2952,0
4) 738—2
184 *acr.* 2*rd.*

84. *acr. rd. p.*
897 . 0 . 10
4
3588 *rd.*
40
143530

85. *p.*
4,0) 7020,0
4) 1755—3
438*acr.* 3*rd.*

86. *p.*
4,0) 342,9—29
4) 85—1
21*acr.* 1*rd.* 29*p*

WINE MEASURE.

87.
hhd.
62
9
558
7
3906 *gal.*

88.
pt.
2) 3038
4) 1519—3
379 *gal.* 3 *qt.*

89.
hhd.
43
9
387
7
2709 *gal.*
4
10836 *qt.*

90.
T. *hhd* *gal*
3 . 1 . 42
4
13 *hhd.*
9
117
7
861 *gal.*

91.
qt.
4) 7308
7) 1827
9) 261
29 *hhd.*

92.
ank. *gal.*
150 . 7
10
1507 *gal.*
4
6028 *qt.*

93.
gal.
7) 6792— }
9) 970—7 } 51
4) 107—3
26 *T.* 3 *hhd.* 51 *gal.*

94.
p.
13
2
26 *hhd.*
9
234
7
1638 *gal.*
4
6552 *qt.*

95.
pt.
8) 214051—3
7) 26756—2 } 44
12) 3822—6 }
318 *pun.* 44 *gal.* 3 *pt.*

96.
gal.
3) 3885—0 } 15
6) 1295—5 }
215 *run.* 15 *gal.*

97.
pun. *gal.*
207 . 71
12
2484
7
17459 *gal.*
4
69836 *qt.*

98.
Tuns.
25
4
100 *hhd.*
9
900
7
6300 *gal.*
4
25200 *qt.*

ALE, BEER, AND PORTER MEASURE.

99.
Bar. *fir.* *gal.*
15 . 0 . 4
4
60 *fir.*
9
544 *gal.*

100.
qt.
4) 1425—1
356 *gal.* 1 *qt.*

101.
Bar.
35
4
140 *fir.*
9
1260 *gal.*
8
10080 *pt.*

102.
Hhd.
726
9
6534
6
39204 *gal.*
4
156816 *qt.*

103.
Qt.
4) 11448
6) 2862
9) 477
53 *hhd.*

104.
Bar. *fir.* *gal.*
19 . 2 . 4
4
78 *fir.*
9
706 *gal.*

105.

hhd. gal. qt. pt.
303 . 38 . 3 . 1
9

2727
6

16400 *gal.*
4

65603 *qt.*
2

131207 *pt.*

106.

gal.
9) 1022—5

4) 113—1

28 *bar.* 1 *fir.* 5 *gal.*

107.

bar. fir. gal. pt.
180 . 2 . 4 . 5
4

722 *fir.*
9

6502 *gal.*
8

52021 *pt.*

108.

pt.
8) 9272

9) 1159—7

4) 128—0

32 *bar.* 0 *fir.* 7 *gal.*

109.

pt.
8) 26677—5

6) 3334—4 }
9) 555—6 } 40

61 *hhd.* 40 *gal.* 5 *pt.*

110.

4) 29966—2

9) 7491—3

2) 832—0

416 *kil.* 0 *fir.* 3 *gal.* 2 *qt.*

DRY MEASURE.

111.

qr.
23
8

184 *bu.*

112.

Gal.
2) 161—1

80 *pk.* 1 *gal.*

113.
Pk.
4) 2906—2
726 *bu.* 2 *pk.*

114.
Qt.
4) 367—3
2) 91—1
4) 45—1
11 *bu.* 1 *pk.* 1 *gal.* 3 *pt.*

115.
Qr. *bu.* *pk.*
442 . 5 . 3
8
3541 *bu.*
4
14167 *pk.*

116.
Ch. *bu.*
278 . 34
6
1668
6
10042 *bu.*

117.
Pk.
4) 3898—2
8) 974—6
121 *qr.* 6 *bu.* 2 *pk.*

118.
Bu.
8) 24967—7
1,0) 312,0
312 *last.* 0 *qr.* 7 *bu.*

119.
Pk.
4) 9727—3
6) 2431—1 } 19
6) 405—3 }
67 *ch.* 19 *bu.* 3 *pk.*

120.
Bu.
2
4
8 *pk.*
2
16 *gal.*
4
64 *qt.*

TIME.

121.
Hr. *min.*
16 . 40
60
1000 *min.*

122.
Da.
7) 271—5
4) 38—2
9 *mo.* 2 *wk.* 5 *da.*

123. *Da.*
11
6
66
4
264 *hr.*
60
15840 *min.*

124. *mo.* *hr.*
9 . 17
4
36 *wk.*
7
252 *da.*
6
1512
4
6065 *hr.*

125. *mo.* *da.* *min*
2 . 3 . 16
28
59 *da.*
6
354
4
1416 *hr.*
60
84976 *min.*

126. *Sec.*
6,0) 426690,0
6,0) 7111,5—15
4) 1185—1 } 9
6) 296—2 }
49 *da.* 9 *hr.* 15 *min.*

127. *Hr.*
4) 5076—0 } 12
6) 1269—3 }
7) 211—1
30 *wk.* 1 *da.* 12 *hr.*

128. *Hr.*
4) 5900—0 } 20
6) 1475—5 }
7) 245
4) 35—3
8 *mo.* 3 *wk.* 20 *hr.*

129. *Min.*
6,0) 5328,9—9
4) 888
6) 222
7) 37—2
5 *wk.* 2 *da.* 0 *hr.* 9 *min.*

130.
Da. *hr.* *min.* *sec.* *th.*
365 . 5 . 48 . 57 . 39
6
2190
4
8765 *hr.*
60
525948 *min.*
60
31556937 *sec.*
60
1893416259 *th.*

MOTION.

131.
180°
60
10800 *min.*
60
648000 *sec.*

132.
21° . 10′ . 43″
60
1270′
60
76243″

133.
Min.
6,0) 67,0—10
11° . 10′

134.
30°
60
1800′
60
108000″
60
6480000‴

135.
6480000 Thirds in one sign.
12
77760000‴

136.
Min.
6,0) 700 8 0,9—9
6,0) 116 8,0—40
3,0) 19,4—14
6 *s.* 14° 40′ 9″

COMPOUND ADDITION.

MONEY.

	£.	s.	d.
1	18	7	8
2	29	19	6
3	25	12	0
4	31	19	1
5	26	8	10
6	25	4	4
7	29	9	3¾
8	28	19	2¼
9	20	0	11
10	30	0	10½
11	41	2	2¾
12	29	9	10½
13	30	18	1¼
14	37	19	5¾
15	23	3	4¾
16	30	9	9¾
17	34	7	0¼
18	41	10	2
19	288	2	3¾
20	201	6	9
21	258	7	2½
22	272	14	6¼
23	180	3	3¾
24	224	2	7¾
25	264	1	9¾
26	237	12	7½
27	280	6	8¾
28	244	16	2¾
29	265	11	10¼
30	260	13	1¾
31	256	5	10¾
32	298	3	6¼
33	280	10	0
34	248	8	4¾
35	293	8	4½
36	411	13	3¼
37	395	3	2
38	376	6	11
39	281	9	9¾
40	336	2	10¾
41	407	4	7¼
42	296	13	5½
43	408	3	9¾
44	345	10	8¾
45	416	18	11½
46	560	18	5¾
47	485	1	6
48	580	3	4¼
49	2295	17	10¾
50	3570	9	3¼
51	1140	15	7¾
52	3266	7	4½
53	1373	17	1¼
54	1419	0	11¼
55	595	13	5
56	3908	14	3¾
57	3685	10	7½
58	4327	2	10¾
59	3361	17	7¾
60	1000	0	0¼
61	8175	19	10½
62	38468	13	5¾

WEIGHTS AND MEASURES.

TROY WEIGHT.

63	66	11	14	
64	171	3	0	12
65	140	8	9	
66	162	1	14	10

AVOIRDUPOIS.

67	77	4	6	
68	154	10	2	2
69	106	10	8	
70	490	14	1	20

APOTHECARIES.

71	57	1	5	
72	26	2	10	
73	196	7	4	0

CLOTH MEASURE

74	257	3	1
75	99	4	2
76	240	0	0
77	279	0	2
78	607	3	2
79	335	2	1

LONG MEASURE.

80	152	2	21	
81	583	2	9	0
82	608	10	2	
83	149	2	4	36

LAND MEASURE.

84	951	2	35
85	1342	3	9
86	1289	0	30

WINE MEASURE.

87	163	1	0	
88	101	0	42	2
89	148	28	6	
90	163	0	44	3

ALE AND BEER.

91	344	0	7	
92	314	49	0	
93	638	1	5	7
94	570	2	3	
95	379	20	1	
96	2178	1	7	6

DRY MEASURE.

97	364	6	2
98	749	2	0
99	295	23	0
100	221	7	1
101	209	0	3
102	268	7	2

TIME.

103	98	0	5	
104	317	6	8	16
105	375	22	27	
106	117	0	4	21

QUESTIONS IN ADDITION.

1.
5271
169
147
4689
596
64
10936 Ans.

2.
63746
9162
778
8047
57239
250
139221 Ans.

3.
579367
422919
45367
894523
78250
57401
30078
2107905 Ans.

4.
100
73029
7971
5061942
8417
99
31315
5182873 Ans.

5.
1787
277
2064 Ans.

6.
1840
1108
2948 years in 1840.

7.
1184
1840
3024 years in 1840.

9.
426000000 distance of Jupiter.
780000000 distance of Saturn.
1206000000 miles.

10.
Mls.
81000000
240000
81240000 dist. in a lunar eclipse

11.
62
18
80 greater number.
62
142 sum of both.

12.
46750
6500
53250 eldest daughter's fortune
46750
£100000 sum of both fortunes.

13.
November . . 21
December . . 17
38 Days. Ans.

14.

January	31
February	28
March	31
April	30
May	31
June	30
July	31
August	31
September	30
October	31
November	30
December	31
	365 Days.

15

May	18
June	30
July	31
August	31
September	30
October	5
	145 Days.

16.

May	25
June	30
July	31
August	31
September	30
October	31
November	30
December	31
January	31
February	29 leap year.
March	31
April	24
	354 Days.

17.

February	22
March	31
April	30
May	31
June	30
July	31
August	31
September	30
October	31
November.	30
December	9
	306 Days.

18.

12
7
17

36 Miles.

19.

7
12
13
18
17
16
14
8
11
10
10
8

144 Miles.

20.

£.	s.	d.
25	12	5
18	8	10¾
9	15	0
18	6	11½
11	0	8
16	16	4
96	0	3¼

21.

£.	s.	d.
101	0	10½
8	19	7¾
53	10	0¾
242	0	9
30	0	1½
10	17	6
446	8	11½

22.

	£.	s.	d.
W..	5	5	0
X..	13	2	6
Y..	8	0	9
Z..	6	10	0½
	32	18	3½

23.

£.	s.	d.
13	11	10¼
37	14	11
10	0	2½
8	3	9
69	10	8¾

24.

£.	s.	d.
502	5	6½
30	13	3¾
532	18	10¼

25.

£.	s.	d.
51	2	11
47	13	9½
3	0	0
12	3	6¾
16	1	10
36	13	8
166	15	9¼

26.

£.	s.	d.
3	0	7
0	11	10½
1	5	0
0	6	0½
0	19	9
10	0	10
16	4	1

27.

£.	s.	d.
4	19	0
17	6	6
1	10	0
3	5	0
1	10	1
9	8	6
37	19	1

28.

£.	s.	d.
0	13	0
0	17	6
0	14	7
0	13	6
1	1	0
1	4	8¼
5	4	3¼

29.

£.	s.	d.
0	6	10½
1	1	3
0	9	4
1	8	10¼
0	19	1½
10	15	6
15	0	11¼

30.

£.	s.	d.
1	3	9
1	17	6½
4	14	3
3	1	7
4	10	10
3	7	10
18	15	9½

31.

DISBURSEMENTS.	£.	s.	d.
Laid out in lamb, ten groats	0	3	4
——— salad, one penny	0	0	1
——— beef, half a crown	0	2	6
——— potatoes, three-pence half-penny	0	0	3½
——— parsnips, seven farthings	0	0	1¾
——— bread, twenty-one pence	0	1	9
——— butter, seventeen pence farthing	0	1	5¼
——— muffins, three half-pence	0	0	1½
——— fowls, two shillings	0	2	0
——— coffee, six and sixpence	0	6	6
Amount	0	18	2

	£.	s.	d.
A.	16	11	3
B.	31	0	7
C.	5	19	6
D.	13	0	10¼
E.	7	7	0
F.	210	0	0
G.	12	18	0
H.	0	6	11½
I.	8	14	0¼
K.	4	1	10
	£310	0	0

33.

lb.	oz.	dwt
13	9	13
11	8	10
6	4	4
1	9	7
5	1	18
38	9	12

34.

	cwt.	qr.	lb.
No. 1. ..	2	1	11
No. 2. ..	2	2	0
No. 3. ..	2	0	27
	0	1	23
	5	3	24
	13	2	1

35.

lb.	oz.	sc.	dr.	gr
4	6	0	0	8
7	0	3	0	0
0	11	1	2	17
9	4	0	1	0
21	9	5	1	5

36.

yd.	qr.	nl
1546	2	3
1473	3	2
1627	0	0
1305	0	3
1469	3	0
7422	2	0

37.

Ml.	fur.
4	7
3	4
6	0
8	2
5	3
28	0

38.

Ac.	rd.	pl.
3	1	25
5	0	33
2	3	35
12	3	20
7	2	8
32	0	1

39.

T.	*hhd.*	*gal*
4	3	38
3	2	53
4	0	29
0	3	61
10	2	46
24	1	38

40.

Yd.	*ft.*	*in.*
48	2	7
18	1	3
105	0	9
11	2	0
200	0	0
384	0	7

41.

Bar.	*fir.*	*gal.*
7	2	4
8	3	5
3	2	7
5	0	4
6	2	0
31	3	2

42.

Longitude of Constantinople	28°	56'	E.
Longitude of Georgia	80	20	W.
	109	16	

SUBTRACTION OF MONEY.

	£.	s.	d.		£.	s.	d.		£.	s.	d.
1	5	2	4	21	29	7	6	41	497	8	9
2	1	10	0	22	7	2	6½	42	10	0	10½
3	1	3	3¼	23	58	12	4	43	788	15	5
4	5	8	8	24	30	7	1¾	44	299	16	3¾
5	3	3	11	25	14	7	9¾	45	597	13	6¾
6	1	17	5½	26	65	12	7¾	46	384	10	0½
7	0	16	7	27	31	17	10¾	47	135	15	9¾
8	1	6	4¾	28	42	2	3¾	48	670	17	0¾
9	1	16	6¾	29	76	19	11¼	49	729	5	11¾
10	33	11	4	30	0	15	1½	50	809	0	11½
11	28	11	1½	31	12	5	9	51	0	1	10¼
12	9	12	10½	32	58	14	9¼	52	526	16	2¾
13	7	8	8¼	33	31	10	10½	53	386	19	10¼
14	61	15	4½	34	80	4	3½	54	9	19	5½
15	20	10	10½	35	34	13	11½	55	133	19	8¼
16	73	2	9¾	36	10	6	11¼	56	42	13	1¾
17	55	14	11¾	37	67	19	6¼	57	161	9	0¾
18	43	13	10¼	38	0	4	9¾	58	212	17	7¼
19	10	10	2½	39	12	0	9¾	59	354	7	5½
20	0	6	5¼	40	168	15	10¼	60	958	16	10¾

	£.	s.	d.		£.	s.	d.		£.	s.	d.
61	308	9	7¼	68	199	19	11¼	75	809	19	11½
62	357	19	7¾	69	286	14	0¾	76	5090	5	11½
63	397	15	5	70	187	18	10½	77	999	19	11¾
64	230	19	4¾	71	0	19	11¾	78	0	0	0¼
65	240	19	0½	72	127	12	5¼	79	45	0	11¾
66	28	19	8¾	73	234	0	9	80	380	17	4½
67	557	14	7½	74	445	16	10¾	81	2	16	6

WEIGHTS AND MEASURES.

TROY WEIGHT.

82	6	8	19	
83	39	0	17	14
84	13	11	4	
85	20	9	15	22

AVOIRDUPOIS.

86	10	14	3	
87	15	19	0	27
88	15	12	15	
89	228	9	0	27

APOTHECARIES.

90	17	4	6	2	
91	24	11	7	1	17

CLOTH MEASURE

92	9	3	1
93	158	1	1
94	26	3	1
95	204	3	3
96	286	4	0
97	57	2	2

LONG MEASURE

98	237	9	2	
99	34	2	4	38
100	5	5	30	
101	20	2	10	1

LAND MEASURE

102	326	0	30
103	719	0	32
104	30	2	22

WINE MEASURE

105	5	1	58	
106	34	81	1	1
107	12	13	1	
108	46	3	60	3

ALE AND BEER.

109	180	2	8	
110	28	40	6	
111	546	1	6	3
112	1	3	6	
113	85	52	6	
114	173	0	8	2

DRY MEASURE.

115	59	3	3
116	42	1	7
117	52	32	2
118	78	4	2
119	798	0	1
120	13	35	2

TIME.

121	27	17	56	
122	8	3	5	22
123	19	3	2	
124	39	3	18	51

QUESTIONS IN SUBTRACTION.

1. $\begin{array}{r}305\\97\\\hline 208\end{array}$

2. $\begin{array}{r}1013\\201\\\hline 812\end{array}$

3. $\begin{array}{r}645300\\64530\\\hline 580770\end{array}$

4. $\begin{array}{r}1000000\\1000\\\hline 999000\end{array}$

5. $\begin{array}{r}900000000\\900000\\\hline 899100000\end{array}$

6. $\begin{array}{r}73\\26\\\hline 47\end{array}$

7. $\begin{array}{r}10110\\9001\\\hline 1109\end{array}$

8. $\begin{array}{r}1000000\\99000\\\hline 901000\end{array}$

9. $\begin{array}{l}3410\\1019\\\hline 2391 \text{ lesser num.}\\3410\\\hline 5801 \text{ sum of both}\end{array}$

10. $\begin{array}{l}1814\\1777\\\hline 37 \text{ years.}\end{array}$

11. $\begin{array}{l}1803\\1795\\\hline 8 \text{ years.}\end{array}$

12. $\begin{array}{l}1787\\1473\\\hline 314 \text{ years.}\end{array}$

13. $\begin{array}{l}1840\\1493\\\hline 347 \text{ years in 1840.}\end{array}$

14. $\begin{array}{l}1840\\1066\\\hline 774 \text{ years in 1840.}\end{array}$

15. $\begin{array}{l}1840\\1485\\\hline 355 \text{ years in 1840.}\end{array}$

16. $\begin{array}{l}1840\\1346\\\hline 494 \text{ years in 1840.}\end{array}$

17. $\begin{array}{l}33905\\30624\\\hline 3281 \textit{ lbs.}\end{array}$

18. $\begin{array}{r}120000\\2688\\\hline 117312 \textit{ lbs.}\end{array}$

19. $\begin{array}{r}125000000\\59000000\\\hline 66000000 \text{ miles}\end{array}$

20\.
81000000
240000
80760000 miles

21\.
67000
7970
59030 miles

22\.
763000
2180
760820 miles

23\.
7970 Earth's diam.
2180 Moon's diam.
5790 miles

24\.
300
191
109

25\.

Debts.	Compos.
760	475
860	537
970	606
1180	675
3770	2293
2293	
£1477	

26\.

£.	s.	d.
100	13	3
90	17	8½
9	15	6½

27\.

£.	s.	d.
15	5	0
0	14	0¾
14	10	11¼

28\.

£.	s.	d.
1	11	0½
1	0	11¾
0	10	0¾

29\.

£.	s.	d.
33	0	0
2	0	7¼
30	19	4¾

30\.

£.	s.	d.
15	0	6
4	9	0
10	11	6

31\.

£.	s.	d.
10000	0	0
5090	19	6
4909	0	6

32\.

£.	s.	d.
301	19	10
0	19	7
302	19	5
23	0	11
279	18	6

33\.

£.	s.	d.
2416	2	0¾
1851	17	10¼
564	4	2

34.

	£.	s.	d.
Lent	5000	0	0
	400	13	6
	1200	0	3½
	1310	8	0¼
	900	15	0
Paid	3811	16	10¼
Due	1188	3	1¾

35.

	£.	s.	d.		£.	s.	d.
A.	243	16	9	....	500	0	0
B.	599	0	11	....	150	15	0
C.	777	17	0	....	200	1	6
D.	678	1	7	....	71	17	9
	2298	16	3		922	14	3
	922	14	3				
	1376	2	0				

36.

	£.	s.	d.
	9	12	0
	4	16	0
	13	17	6
	7	4	0
	2	14	0
	2	17	0
	41	0	6
Cr. By Cash..	31	5	0
Balance	9	15	6

37

	11000
17111	1100
12111	11
£5000 Ans.	£12111 son's for.

38.

£.	s.	d.
725	14	2
416	11	9
1142	5	11
1041	12	3
100	13	8

	£.	s.	d.
X..	12	0	0
Y..	999	12	0
Z..	30	0	3
	1041	12	3

39.

	£.	s.	d.
A.	1500	3	7
B.	1990	12	2¾
C.	4011	0	5
	806	7	10½
	8308	4	1¼
	5332	11	10¼
	2975	12	3

40.

lb.	*oz.*	*dwt*	*gr.*
17	3	12	16
12	8	13	19
4	6	18	21

41.

T.	*cwt.*	*qr.*	*lb.*
54	0	0	0
20	1	0	12
33	18	3	16

42.

cwt.	qr.	lb.
13	0	3
8	3	26
4	0	5

	cwt.	qr.	lb.
A......	2	0	17½
B......	3	1	11
C......	2	3	0
D......	0	2	25½
	8	3	26

43.

	tuns.	hhd.	gal.
	173	0	0
	92	2	0
	13	0	42
	278	2	42
Sold....	116	2	54½
On hand	161	3	50½

tuns.	hhd.	gal.	
58	3	58	
41	0	31½	
12	2	36	= 50 *hhd.* 36 *gal.*
3	3	55	= 1000 *gal.*
116	2	54½	

44.

1605
43
1648

1330	
330	
1660	
1648	
12	years.

45.

	1656
	1336
Solomon's Temple built..	2992
	175
London built, A. M.	2817

	4000
	744
Rome built, A. M..	3256
	113
Carthage built, A.M.	3143
	2817
London the ancienter city by	326 years.

COMPOUND MULTIPLICATION.

MONEY.

1.

£.	s.	d.
3	15	7
		2
7	11	2

2.

£.	s.	d.
2	11	8
		3
7	15	0

3.

£.	s.	d.
5	4	9
		4
20	19	0

4.

£.	s.	d.
5	0	3
		5
25	1	3

5.

£.	s.	d.
8	16	4¼
		6
52	18	1½

6.

£.	s.	d.
6	5	6
		7
43	18	6

7.

£.	s.	d.
4	13	2¾
		8
37	5	10

8.

£.	s.	d.
4	15	5½
		9
42	19	1½

9.

£.	s.	d.
2	10	9
		10
25	7	6

10.

£.	s.	d.
7	8	2½
		11
81	10	3½

11.

£.	s.	d.
9	15	11
		12
117	11	0

12.

£.	s.	d.
1	4	3¾
		2
2	8	7½

13.

£.	s.	d.
17	11	0½
		3
52	13	1½

14.

£.	s.	d.
15	13	7
		4
62	14	4

15.

£.	s.	d.
5	19	10¾
		5
29	19	5¾

16.

£.	s.	d.
9	13	6½
		6
58	1	3

17.

£.	s.	d.
3	11	5
		7
24	19	11

18.

£.	s.	d.
18	2	11
		8
145	3	4

19.
$$\begin{array}{rrr} \text{£.} & \text{s.} & \text{d.} \\ 12 & 0 & 5\frac{1}{4} \\ & & 9 \\ \hline 108 & 3 & 11\frac{1}{4} \\ \hline\hline \end{array}$$

20.
$$\begin{array}{rrr} \text{£.} & \text{s.} & \text{d.} \\ 13 & 9 & 5 \\ & & 10 \\ \hline 134 & 14 & 2 \\ \hline\hline \end{array}$$

21.
$$\begin{array}{rrr} \text{£.} & \text{s.} & \text{d.} \\ 14 & 19 & 9\frac{1}{2} \\ & & 11 \\ \hline 164 & 17 & 8\frac{1}{2} \\ \hline\hline \end{array}$$

22.
$$\begin{array}{rrr} \text{£.} & \text{s.} & \text{d.} \\ 35 & 18 & 10\frac{1}{4} \\ & & 12 \\ \hline 431 & 6 & 3 \\ \hline\hline \end{array}$$

23.
$$\begin{array}{rrrl} \text{£.} & \text{s.} & \text{d.} & \\ 49 & 1 & 6\frac{1}{2} & \times 14 \\ & & 2 & \\ \hline 98 & 3 & 1 & \\ & & 7 & \\ \hline 687 & 1 & 7 & \\ \hline\hline \end{array}$$

24.
$$\begin{array}{rrrl} \text{£} & \text{s.} & \text{d.} & \\ 38 & 7 & 1\frac{3}{4} & \times 18 \\ & & 6 & \\ \hline 230 & 2 & 10\frac{1}{2} & \\ & & 3 & \\ \hline 690 & 8 & 7\frac{1}{2} & \\ \hline\hline \end{array}$$

25.
$$\begin{array}{rrrl} \text{£.} & \text{s.} & \text{d.} & \\ 22 & 16 & 1\frac{1}{2} & \times 21 \\ & & 7 & \\ \hline 159 & 12 & 10\frac{1}{2} & \\ & & 3 & \\ \hline 478 & 18 & 7\frac{1}{2} & \\ \hline\hline \end{array}$$

26.
$$\begin{array}{rrrl} \text{£} & \text{s.} & \text{d.} & \\ 26 & 6 & 4\frac{1}{2} & \times 22 \\ & & 11 & \\ \hline 289 & 10 & 1\frac{1}{2} & \\ & & 2 & \\ \hline 579 & 0 & 3 & \\ \hline\hline \end{array}$$

27.
$$\begin{array}{rrrl} \text{£} & \text{s.} & \text{d.} & \\ 36 & 3 & 10\frac{3}{4} & \times 25 \\ & & 5 & \\ \hline 180 & 19 & 5\frac{3}{4} & \\ & & 5 & \\ \hline 904 & 17 & 4\frac{3}{4} & \\ \hline\hline \end{array}$$

28.
$$\begin{array}{rrrl} \text{£} & \text{s.} & \text{d.} & \\ 60 & 0 & 11\frac{1}{2} & \times 28 \\ & & 7 & \\ \hline 420 & 6 & 8\frac{1}{2} & \\ & & 4 & \\ \hline 1681 & 6 & 10 & \\ \hline\hline \end{array}$$

29.
$$\begin{array}{rrrl} \text{£} & \text{s.} & \text{d.} & \\ 95 & 19 & 2\frac{3}{4} & \times 30 \\ & & 10 & \\ \hline 959 & 12 & 3\frac{1}{2} & \\ & & 3 & \\ \hline 2878 & 16 & 10\frac{1}{2} & \\ \hline\hline \end{array}$$

30.
$$\begin{array}{rrrl} \text{£} & \text{s.} & \text{d.} & \\ 3 & 18 & 8\frac{3}{4} & \times 33 \\ & & 11 & \\ \hline 43 & 6 & 0\frac{1}{4} & \\ & & 3 & \\ \hline 129 & 18 & 0\frac{3}{4} & \\ \hline\hline \end{array}$$

31.
$$\begin{array}{rrrl} \text{£.} & \text{s.} & \text{d.} & \\ 6 & 12 & 9 & \times 36 \\ & & 6 & \\ \hline 39 & 16 & 6 & \\ & & 6 & \\ \hline 238 & 19 & 0 & \\ \hline\hline \end{array}$$

32.

£.	s.	d.	
51	14	9¼	× 42
		7	
362	3	4¾	
		6	
2173	0	4½	

33.

£.	s.	d.	
84	11	10½	× 45
		9	
761	6	10½	
		5	
3806	14	4½	

34.

£	s.	d.	
27	15	11	× 48
		8	
222	7	4	
		6	
1334	4	0	

35.

£	s.	d.	
13	18	0¾	× 54
		9	
125	2	6¾	
		6	
750	15	4½	

36.

£	s.	d.	
35	16	4¾	× 55
		11	
394	0	4¼	
		5	
1970	1	9¼	

37.

£	s.	d.	
58	14	11¼	× 56
		8	
469	19	6	
		7	
3289	16	6	

38.

£	s.	d.	
19	0	0¼	× 63
		9	
171	0	2¼	
		7	
1197	1	3¾	

39.

£	s.	d.	
0	17	3¼	× 66
		11	
9	9	11¾	
		6	
56	19	10½	

40.

£	s.	d.	
0	10	0¾	× 72
		9	
4	10	6¾	
		8	
36	4	6	

41.

£	s.	d.	
5	5	8¾	× 80
		10	
52	17	3½	
		8	
422	18	4	

42.

£	s.	d.	
10	13	5½	× 81
		9	
96	1	1½	
		9	
864	10	1½	

43.

£	s.	d.	
0	15	2½	× 84
		12	
9	2	6	
		7	
63	17	6	

44.

£	s.	d.	
12	12	0¼	× 88
		11	
138	12	2¾	
		8	
1108	17	10	

45.

£	s.	d.	
18	10	7	× 99
		11	
203	16	5	
		9	
1834	7	9	

46.

£	s.	d.	
43	19	9¼	× 100
		10	
439	17	8½	
		10	
4398	17	1	

47.
£ s. d.
0 0 11½ × 108
12
0 11 6
9
5 3 6

48.
£ s. d.
3 13 0¼ × 110
11
40 3 2¾
10
401 12 3½

49.
£ s. d.
7 9 5¾ × 132
12
89 13 9
11
986 11 3

50.
£ s. d.
492 8 10¼ × 144
12
5909 6 3
12
70911 15 0

51.
£ s. d.
0 2 8 × 112
8 × 7 × 2 = 112
1 1 4
7
7 9 4
2
14 18 8

52.
£ s. d.
1 11 5 × 432
12 × 9 × 4 = 432
18 17 0
9
169 13 0
4
678 12 0

53.
£ s. d.
0 11 7¾ × 693
11 × 9 × 7 = 693
6 8 1¼
9
57 12 11¼
7
403 10 6¾

54.
£ s. d.
7 9 6 × 1584
12 × 12 × 11 = 1584
89 14 0
12
1076 8 0
11
11840 8 0

55.

	£	s.	d.	
	8	18	3½	× 13
			12	+ 1 = 13
	106	19	6	
Add	8	18	3½	once top line.
	115	17	9½	

56.

	£	s.	d.	
	2	7	6¼	× 17
			12	+ 5 = 17
	28	10	3	
Add	11	17	7¼	5 times top line.
	40	7	10¼	

57.

	£	s.	d.	
	20	2	9	× 19
			12	+ 7 = 19
	241	13	0	
Add	140	19	3	7 times top line,
	382	12	3	

58.

	£	s.	d.	
	1	17	4¾	× 23
			12	+ 11 = 23
	22	8	9	
Add	20	11	4¼	11 times top line.
	43	0	1¼	

59.

	£	s.	d.	
	0	8	0¾	× 34
			7	× 5 = 35 — 1 = 34
	2	16	5¼	
			5	
	14	2	2¼	
Sub.	0	8	0¾	once top line.
	13	14	1½	

60.

	£	s.	d.	
	71	5	0½	× 38
			6	× 6 = 36 + 2 = 38
	427	10	3	
			6	
	2565	1	6	
Add	142	10	1	twice top line.
	2707	11	7	

61.

	£	s.	d.	
	4	1	10¼	× 46
			9	× 5 = 45
	36	16	8¼	
			5	
	184	3	5¼	
Add	4	1	10¼	once top line.
	188	5	3½	

62.

	£	s.	d.	
	0	19	3¾	× 52
			10	× 5 = 50
	9	13	1½	
			5	
	48	5	7½	
Add	1	18	7½	twice top line.
	50	4	3	

63.	£	s.	d.	
	23	19	11½	× 68
			10	× 7 = 70
	239	19	7	
			7	
	1679	17	1	
Sub.	47	19	11	twice top line.
	1631	17	2	

64.	£	s.	d.	
	53	4	5¼	× 69
			10	× 7 = 70
	532	4	4½	
			7	
	3725	10	7½	
Sub.	53	4	5¼	once top line.
	3672	6	2¼	

65.	£	s.	d.	
	109	4	6½	× 75
			9	× 8 = 72
	983	0	10½	
			8	
	7864	7	0	
Add	327	13	7½	3 times top line
	8192	0	7½	

66.	£	s.	d.	
	86	13	5¾	× 83
			12	× 7 = 84
	1040	1	9	
			7	
	7280	12	3	
Sub.	86	13	5¾	once top line.
	7193	18	9¼	

67.	£	s.	d.	
	4	19	1¼	× 94
			12	× 8 = 96
	59	9	3	
			8	
	475	14	0	
Sub.	9	18	2½	twice top line.
	465	15	9½	

68.	£	s.	d.	
	1	1	9¾	× 103
			10	× 10 = 100
	10	18	7½	
			10	
	109	1	3	
Add	3	5	5¼	3 times top line.
	112	6	8¼	

69.	£	s.	d.	
	55	8	11	× 106
			12	× 9 = 108
	665	7	0	
			9	
	5988	3	0	
Sub.	110	17	10	twice top line.
	5877	5	2	

70.	£	s.	d.	
	67	0	10½	× 116
			12	× 10 = 120
	804	10	6	
			10	
	8045	5	0	
Sub.	268	3	6	4 times top line.
	7777	1	6	

71.
£ s. d.
25 14 10¼ × 117
12 × 10 = 120

308 18 3
10

3089 2 6
Sub. 77 4 6¾ 3 times top line.

3011 17 11¼

72.
£ s. d.
81 6 6¼ × 122
11 × 11 = 121

894 11 8¾
11

9840 9 0¼
Add 81 6 6¼ once top line.

9921 15 6½

73.
£ s. d.
31 18 2¼ × 129
12 × 11 = 132

382 18 3
11

4212 0 9
Sub. 95 14 6¾ 3 times top line.

4116 6 2¼

74.
£ s. d.
18 11 11¼ × 139
12 × 12 = 144

223 3 3
12

2677 19 0
Sub. 92 19 8¼ 5 times top line.

2584 19 3¾

75.
£ s. d.
64 3 7¾ × 147
12 × 12 = 144

770 3 9
12

9242 5 0
Add 192 10 11¼ 3 times top line.

9434 15 11¼

76.
£ s. d.
4 19 8¼ × 151
12 × 12 = 144

59 16 9
12

718 1 0
Add 34 18 1¼ 7 times top line.

752 19 1¼

77.

	£	s.	d.	
	10	12	6×3½	
			3+½=3½	
	31	17	6	
Add	5	6	3	half top line.
	37	3	9	

78.

	£	s.	d.	
	6	16	2×5½	
			5+½=5½	
	34	0	10	
Add	3	8	1	half top line.
	37	8	11	

79.

	£	s.	d.	
	4	4	8×6¼	
			6+¼=6¼	
	25	8	0	
Add	1	1	2	fourth top line.
	26	9	2	

80.

	£	s.	d.	
	8	4	8×8¼	
			8+¼=8¼	
	65	17	4	
Add	2	1	2	fourth top line.
	67	18	6	

81.

	£	s.	d.	
	8	16	4×9¾	
			10 − ¼=9¾	
	88	3	4	
Sub.	2	4	1	fourth top line.
	85	19	3	

82.

	£	s.	d.	
	4	8	4×10¾	
			11−¼=10¾	
	48	11	8	
Sub.	1	2	1	fourth top line.
	47	9	7	

83.

	£	s.	d.	
	9	7	5×1 1	
			11+¼=11¼	
	103	1	7	
Add	2	6	10¼	fourth top line.
	105	8	5¼	

84.

	£	s.	d.	
	13	1	7×12¼	
			12+¼=12¼	
	156	19	0	
Add	3	5	4¼	fourth top line.
	160	4	4¼	

85.

	£	s.	d.	
	7	10	10½×15½	
			5 ×3=15+½=15½	
	37	14	4½	
			3	
	113	3	1½	
Add	3	15	5¼	half top line.
	116	18	6¾	

86.

	£	s.	d.	
	11	2	5½×16½	
			4 ×4=16+½=16½	
	44	9	10	
			4	
	177	19	4	
Add	5	11	2¾	half top line.
	183	10	6¾	

87.

	£	s.	d.	
	5	3	7	× 13¼
			12	+ 1 + ¼ = 13¼
	62	3	0	
Add	5	3	7	once top line.
	1	5	10¾	fourth top line.
	68	12	5¾	

88.

	£	s.	d.	
	8	13	9	× 13½
			12	+ 1 + ½ = 13½
	104	5	0	
Add	8	13	9	once top line.
	4	6	10½	half top line.
	117	5	7½	

89.

	£	s.	d.	
	13	15	0¾	× 17½
			4	× 4 = 16 + 1 + ½
	55	0	3	
			4	
	220	1	0	
Add	13	15	0¾	once top line.
	6	17	6⅜	(1) ½ top line.
	240	13	7	

90.

	£	s.	d.	
	17	12	6	× 26¼
			5	× 5 = 25 + 1 + ¼
	88	2	6	
			5	
	440	12	6	
Add	17	12	6	once top line.
	4	8	1½	fourth top line.
	462	13	1½	

91.

	£	s.	d.	
	6	11	2	× 36¾
			6	× 6 = 36 + ½ + ¼
	39	7	0	
			6	
	236	2	0	
Add	3	5	7	half top line.
	1	12	9½	fourth top line.
	241	0	4½	

92.

	£	s.	d.	
	35	17	10	× 45¾
			9	× 5 = 45 + ½ + ¼
	323	0	6	
			5	
	1615	2	6	
Add	17	18	11	half top line.
	8	19	5½	fourth top line.
	1642	0	10½	

93.

	£	s.	d.	
	12	18	9¾	× 58½
			8	× 7 = 56 + 2 + ½
	103	10	6	
			7	
	724	13	6	
Add	25	17	7½	twice top line.
	6	9	4⅞	(1) ½ top line.
	757	0	6⅜	

94.

	£	s.	d.	
	2	5	11¼	× 62¼
			10	× 6 = 60 + 2 + ¼
	22	19	4½	
			6	
	137	16	3	
Add	4	11	10½	twice top line.
	0	11	5¾	(1) ¼ top line.
	142	19	7¼	

95.
$$\begin{array}{rrrrl}
 & \pounds & s. & d. & \\
 & 0 & 6 & 11 & \times 76\frac{3}{4} \\
 & & & 11 & \times 7 = 77 - \frac{1}{4} \\
\hline
 & 3 & 16 & 1 & \\
 & & & 7 & \\
\hline
 & 26 & 12 & 7 & \\
\text{Sub.} & 0 & 1 & 8\frac{3}{4} & \text{fourth top line.} \\
\hline
 & \underline{26} & \underline{10} & \underline{10\frac{1}{4}} & \\
\end{array}$$

96.
$$\begin{array}{rrrrl}
 & \pounds & s. & d. & \\
 & 0 & 19 & 7\frac{1}{4} & \times 120\frac{1}{4} \\
 & & & 12 & \times 10 = 120 + \frac{1}{4} \\
\hline
 & 11 & 15 & 3 & \\
 & & & 10 & \\
\hline
 & 117 & 12 & 6 & \\
\text{Add} & 0 & 4 & 10\frac{3}{4} & (1)\ \frac{1}{4}\ \text{top line.} \\
\hline
 & 117 & 17 & 4\frac{3}{4} & \\
\end{array}$$

97.
$$\begin{array}{rrrrl}
 & \pounds & s. & d. & \\
 & 0 & 10 & 6\frac{3}{4} & \times 69\frac{1}{3} \\
 & & & 11 & \times 6 = 66 + 3 + \frac{1}{3} \\
\hline
 & 5 & 16 & 2\frac{1}{4} & \\
 & & & 6 & \\
\hline
 & 34 & 17 & 1\frac{1}{2} & \\
\text{Add} \left\{ \right. & 1 & 11 & 8\frac{1}{4} & 3\ \text{times top line.} \\
 & 0 & 3 & 6\frac{1}{4} & \frac{1}{3}\ \text{top line.} \\
\hline
 & \underline{36} & \underline{12} & \underline{4} & \\
\end{array}$$

98.
$$\begin{array}{rrrrl}
 & \pounds & s. & d. & \\
 & 4 & 15 & 4 & \times 110\frac{3}{8} \\
 & & & 11 & \times 10 = 110 + \frac{1}{4} + \frac{1}{8} \\
\hline
 & 52 & 8 & 8 & \\
 & & & 10 & \\
\hline
 & 524 & 6 & 8 & \\
\text{Add} \left\{ \right. & 1 & 3 & 10 & \frac{1}{4}\ \text{top line.} \\
 & 0 & 11 & 11 & \frac{1}{8}\ \text{top line.} \\
\hline
 & \underline{526} & \underline{2} & \underline{5} & \\
\end{array}$$

*** In some of the Examples in the last Case, the remainders, after the farthings are brought out by dividing, are not noticed in the small Key. I think it would be better to omit the last Case altogether, until the Learner is acquainted with Division of Money. This for obvious reasons.

99.
$$\begin{array}{rrrl}
\pounds & s. & d. & \\
0 & 2 & 3 & \times 150 \\
 & & 5 & \times 3 \times 10 = 150 \\
\hline
0 & 11 & 3 & \\
 & & 3 & \\
\hline
1 & 13 & 9 & \\
 & & 10 & \\
\hline
\underline{16} & \underline{17} & \underline{6} & \\
\end{array}$$

100.
$$\begin{array}{rrrl}
\pounds & s. & d. & \\
0 & 6 & 2 & \times 240 \\
 & & 6 & \times 4 \times 10 = 240 \\
\hline
1 & 17 & 0 & \\
 & & 4 & \\
\hline
7 & 8 & 0 & \\
 & & 10 & \\
\hline
\underline{74} & \underline{0} & \underline{0} & \\
\end{array}$$

101.	£	s.	d.	
	0	0	7	×4900
				7×7×10×10
	0	4	1	
			7	
	1	8	7	
			10	
	14	5	10	
			10	
	142	18	4	

102.	£	s.	d.	
	2	5	6	×960½
				12×8×10=960+½
	27	6	0	
			8	
	218	8	0	
			10	
	2184	0	0	
Add	1	2	9	half top line.
	2185	2	9	

103.	£	s.	d.	
	2	18	4	×265
				9×3×10=270—5
	26	5	0	
			3	
	78	15	0	
			10	
	787	10	0	
Sub.	14	11	8	five times top line.
	772	18	4	

104.	£	s.	d.	
	0	1	5	×365
				6×6×10+5=365
	0	8	6	
			6	
	2	11	0	
			10	
	25	10	0	
Add	0	7	1	five times top line.
	25	17	1	

* * *

⁂ An ingenious solution of the last Example may be obtained thus:—

s.	d.			£.	s.	d.	
1	5	=17d.	then	17	0	0	
				8	10	0	
				0	7	1	
				25	17	1	the same as before.

This may be left for the developement of the curious.

105.

	£.	s.	d.	
	0	4	4½	× 300
			10	
Ten line	2	3	9	
			10	
Hun. line	21	17	6	
			3	
	65	12	6	= 300

106.

	£.	s.	d.	
	5	1	2	× 1000
			10	
Ten line	50	11	8	
			10	
Hun. line	505	16	8	
			10	
	5058	6	8	

107.

	£.	s.	d.	
	3	9	3	× 406
			10	
Ten line	34	12	6	
			10	
Hun. line	346	5	0	
			4	
	1385	0	0	= 400
	20	15	6	= 6
	1405	15	6	

108.

	£.	s.	d.	
	0	3	5	× 780
			10	
Ten line	1	14	2	
			10	
Hun. line	17	1	8	
			7	
	119	11	8	= 700
	13	13	4	= 80
	133	5	0	

109.

	£.	s.	d.	
	0	0	8¼	× 652
			10	
Ten line	0	6	10½	
			10	
Hun. line	3	8	9	
			6	
	20	12	6	= 600
	1	14	4½	= 50
	0	1	4½	= 2
	22	8	3	

110.

	£.	s.	d.	
	0	3	6¾	× 833
			10	
Ten line	1	15	7½	
			10	
Hun. line	17	16	3	
			8	
	142	10	0	= 800
	5	6	10½	= 30
	0	10	8¼	= 3
	148	7	6¾	

111.

	£.	s.	d.	
	0	18	1	× 1115
			10	
Ten line	9	0	10	
			10	
Hun. line	90	8	4	
			11	
Thou. line	994	11	8	= 1100
	9	0	10	= 10
	4	10	5	= 5
	1008	2	11	

112.

	£.	s.	d.	
	0	12	11	× 6734¼
			10	
Ten line	6	9	2	
			10	
Hun. line	64	11	8	
			10	
Thou. line	645	16	8	
			6	
	3875	0	0	= 6000
	452	1	8	= 700
	19	7	6	= 30
	2	11	8	= 4
	0	3	2¾	= ¼
	4349	4	0¾	

* * *

A Learner would better understand the following mode of operation. Take, for instance, the last Example.

```
 s.   d.                      6734¼
 12   11                       155
 12                        ─────────
 ───────                     33670 × 3
 155 pence.                 101010
 ───────                   ──────────
                         12 1043770 — 10
                           ──────────
                         2,0 8698,0
                           ────────────
                             4349  0 10
                                   3  2¾ = ¼
                           ─────────────
                         £ 4349  4  0¾
```

Besides, this [illegible] at the same time, [illegible]

WEIGHTS AND MEASURES.

TROY WEIGHT.

113.

lb.	*oz.*	*dwt*
12	1	9
		2
24	2	18

114.

lb.	*oz.*	*dwt.*	*gr.*
35	6	17	13
			3
106	8	12	15

115.

oz.	*dwt.*	*gr.*
84	3	7
		4
336	13	4

116.

lb.	*oz.*	*dwt.*	*gr.*
23	4	6	20
			5
116	9	14	4

AVOIRDUPOIS WEIGHT.

117.

lb.	*oz.*	*dr.*
9	12	8
		6
58	11	0

118.

T.	*cwt.*	*qr.*	*lb.*
4	11	1	21
			7
32	0	0	7

119.

lb.	*oz.*	*dr.*
16	13	10
		8
134	13	0

120.

T.	*cwt.*	*qr.*	*lb.*
50	12	3	18
			9
455	16	0	22

APOTHECARIES WEIGHT.

121.

lb.	*oz.*	*dr.*	*sc.*
7	4	6	2
			10
74	0	2	2

122.

lb.	*oz.*	*dr.*	*sc.*	*gr.*
26	0	2	1	5
				11
286	3	2	1	15

CLOTH MEASURE.

123.

yd.	*qr.*	*nl.*
12	0	3
		12
146	1	0

124.

E.e.	*qr.*	*nl.*
10	2	1
		2
20	4	2

125.

yd.	qr.	nl.
14	3	3
		3
44	3	1

126.

Fl. e.	qr.	nl.
5	1	3
		4
22	1	0

LONG MEASURE.

127.

yd.	ft.	in.
47	2	9
		5
239	1	9

128.

L.	ml.	fur.	pl.
11	1	4	27
			8
92	0	5	16

129.

yd.	ft.	in.
40	1	2
		9
363	1	6

130.

L.	ml.	fur.	pl.
8	0	7	30
			11
91	1	5	10

LAND MEASURE.

131.

ac.	r.	p.
98	2	14 × 15
		5
492	3	30
		3
1478	3	10

132.

ac.	r.	p.
8	2	5 × 24
		6
51	0	30
		4
204	3	0

133.

ac.	r.	p.
13	0	33 × 16
		4
52	3	12
		4
211	1	8

134.

ac.	r.	p.
2	3	37 × 25
		5
14	3	25
		5
74	2	5

WINE MEASURE.

135.

pp.	hhd.	g.
6	1	43
		4
27	0	46

136.

tuns	hhd.	gl.	qt.
1	2	15	2
			9
14	0	13	2

137.

pun.	*gl.*	*qt.*
2	68	3
		2
5	53	2

138.

tuns	*hhd.*	*gl.*	*qt.*
20	1	33	7
			6
122	1	14	2

ALE, BEER, AND PORTER MEASURE.

139.

	bar.	*fir.*	*gl.*
	73	2	3×37
			6×6+1=37
	441	2	0
			6
	2649	0	0
Add	73	2	3
	2722	2	3

140.

	hhd.	*gl.*	*pt.*
	19	41	6×41
			10×4+1=41
	197	39	4
			4
	790	50	0
Add	19	41	6
	810	37	6

141.

	bar.	*fir.*	*gl.*
	200	3	4×34
			7×5—1=34
	1406	0	1
			5
	7030	0	5
Ded.	200	3	4 once top line.
	6829	1	1

142.

	hhd.	*gl.*	*qt.*
	90	50	3×53
			9×6—1=53
	818	24	3
			6
	4910	40	2
Ded.	90	50	3
	4819	43	3

DRY MEASURE.

143.

bu.	*pk.*	*gl.*
82	1	1
		9
741	1	1

144.

ch.	*bu.*	*pk.*
4	29	3
		10
48	9	2

145.

pk.	*gl.*	*qt.*
25	0	3
		6
152	0	2

146.

qr.	*bu.*	*pk.*
18	6	1
		7
131	3	3

TIME.

147.

h.	*m.*	*s.*
9	54	36
		7
69	22	12

148.

mo.	*wk.*	*d.*	*h.*
10	2	0	21
			11
115	3	2	15

149.

mo.	*wk.*	*da.*
3	3	5
		10
39	1	1

150.

d.	*h.*	*m.*	*s.*
28	0	57	14
			12
336	11	26	48

After the Examples of Weights and Measures in Compound Multiplication, a progressive list of prime numbers is given, as far as 503. The number 13, it appears, is accidentally omitted. There is a remarkable property attending these prime numbers, viz.:—When any one of them, (above the number 3,) is either increased or diminished by a unit, the result is always divisible by 6. Take, for example, 503; then $503 + 1 = 504$; this result is divisible by 6. Again, take 499; here $499 - 1 = 498$; and this is also divisible by 6.

QUESTIONS IN MULTIPLICATION.

1.
8575
7
60025

2.
49187
6
295122

3.
16021
5944
10077
11
110847

4.
79038 × 16
4
316152
4
1264608

5.
7286
17
51002
7286
123862

6.
578 × 28
7
4046
4
16184

7.
30079
40
1203160

8.
1937 × 112
1937
1937
1937
216944

Or thus
1937 × 112
8 × 7 × 2 = 112
15496
7
108472
2
216944

*** The first of these methods is a brief way of reducing cwts. into lbs.

9.
20981
120
2517720

10.
31257
813
32070
4020
28050
800
22440000

11.
204893
730
614679
1434251
149571890

12.
375317
1039
374278
516
2245668
374278
1871390
193127448

13.
310342
2774
307568
540900
2768112
1230272
1537840
166363531200

14.
713003
297
713300
5030
708270
350
354135
212481
247894500

15.
17264
9999
7265 less num.

72650000 prod. by 10000
7265 deduct
72642735 prod. by 9999

16.
1
2
2
3
6
4
24
5
120
6
720
7
5040
8
40320

17. Changes on 8 bells 40320
9
362880
10
3628800

18.
37 counties.
26
222
74
962 parishes.
7
6734
6
40404 families.
12
484848 persons.

19.
217
217
1519
217
434
47089

20.
8013
8013
24039
8013
64104
64208169
8013
192624507
64208169
513665352
514500058197

21. Affix six ciphers to the cube of 24, thus:—
24
6
144
4
576
6
3456
4
13824000000

22.
22
2
44
24
Ans. 20

2
2
4
20
24

23.
39
12
468
138
Ans. 330

9
12
108
30
138

24.
6
6
36

25.

£.	s.	d.
5	13	3
		4
22	13	0

£.	s.	d.	
2	17	4	× 15
		5	
14	6	8	
		3	
43	0	0	

27.

$$\begin{array}{lrrll}
 & \text{£.} & \text{s.} & \text{d.} & \\
 & 3 & 8 & 2\frac{1}{4} & \times 26 \\
 & & & 5 & \times 5 + 1 = 26 \\
\hline
 & 17 & 0 & 11\frac{1}{4} & \\
 & & & 5 & \\
\hline
 & 85 & 4 & 8\frac{1}{4} & \\
\text{Add} & 3 & 8 & 2\frac{1}{4} & \text{once top line} \\
\hline
 & 88 & 12 & 10\frac{1}{2} & \\
\hline\hline
\end{array}$$

28.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
0 & 6 & 2\frac{3}{4} \\
 & & 9 \\
\hline
2 & 16 & 0\frac{3}{4} \\
\hline\hline
\end{array}$$

29.

$$\begin{array}{lrrrl}
 & \text{£.} & \text{s.} & \text{d.} & \\
 & 34 & 11 & 4 & \times 5\frac{1}{4} \\
 & & & 5 & \\
\hline
 & 172 & 16 & 8 & \\
\text{Add} & 8 & 12 & 10 & \frac{1}{4} \text{ top line.} \\
\hline
 & 181 & 9 & 6 & \\
\hline\hline
\end{array}$$

30.

$$\begin{array}{lrrll}
 & \text{£} & \text{s.} & \text{d.} & \\
 & 9 & 13 & 7\frac{1}{2} & \times 11\frac{1}{2} \\
 & & 11 & & \\
\hline
 & 106 & 9 & 10\frac{1}{2} & \\
\text{Add} & 4 & 16 & 9\frac{3}{4} & \frac{1}{2} \text{ top line.} \\
\hline
 & 111 & 6 & 8\frac{1}{4} & \\
\hline\hline
\end{array}$$

31.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
0 & 6 & 10 \\
 & & 2 \\
\hline
0 & 13 & 8 \\
\hline\hline
\end{array}$$

32.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
0 & 18 & 6 \\
 & & 5 \\
\hline
4 & 12 & 6 \\
\hline\hline
\end{array}$$

33.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
0 & 7 & 2\frac{1}{2} \\
 & & 6 \\
\hline
2 & 3 & 3 \\
\hline\hline
\end{array}$$

34.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
0 & 9 & 7 \\
 & & 4 \\
\hline
1 & 18 & 4 \\
\hline\hline
\end{array}$$

35.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
0 & 10 & 9 \\
 & & 3 \\
\hline
1 & 12 & 3 \\
\hline\hline
\end{array}$$

36.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
0 & 0 & 10\frac{3}{4} \\
 & & 8 \\
\hline
0 & 7 & 2 \\
\hline\hline
\end{array}$$

37.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
9 & 11 & 0 \\
0 & 15 & 1\frac{1}{2} \\
\hline
8 & 15 & 10\frac{1}{2} \\
 & & 9 \\
\hline
79 & 2 & 10\frac{1}{2} \\
\hline\hline
\end{array}$$

38.

$$\begin{array}{rrr}
\text{£} & \text{s.} & \text{d.} \\
4 & 19 & 7\frac{1}{4} \\
6 & 1 & 4\frac{1}{2} \\
\hline
11 & 0 & 11\frac{3}{4} \\
 & & 12 \\
\hline
132 & 11 & 9 \\
\hline
\end{array}$$

39.

	£	s.	d.
2)	0	10	5½
	0	5	2¾

40.

	£	s.	d.
4)	0	17	9
	0	4	5¼

41.

	£	s.	d.
4)	0	9	4
Ded.	0	2	4
	0	7	0

42.

	£	s.	d.	
	0	3	7	×9½
			9	
	1	12	3	
Add	0	1	9½	half top line.
	1	14	0½	

43.

£	s.	d.	
1	1	0	
0	5	3	
0	2	6	
1	8	9	
		10	
14	7	6	money in 1 purse
		10	
143	15	0	

44.

	£	s.	d.	
	1	0	7	×11¼
			11	
	11	6	5	
Add	0	5	1¾	¼ top line.
	11	11	6¾	

45.

£	s.	d.
11	4	3½
212	0	3¾
223	4	7¼
2	14	7
220	10	0¼
		6
1323	0	1½

46.

£	s.	d.
1000	6	0
100	0	6
900	5	6
5	10	2¼
905	15	8¼
		7
6340	9	9¾

47.

£	s.	d.	
0	1	11¼	×14
		7	
0	13	6¾	
		2	
1	7	1½	

48.	£	s.	d.	
	0	6	10¼	× 16
			4	
	1	7	7	
			4	
	5	10	4	

49.	£	s.	d.	
	1	15	9	× 15
			5	
	8	18	9	
			3	
	26	16	3	

50.	£	s.	d.	
	1	18	3½	× 20
			10	
	19	2	11	
			2	
	38	5	10	

51.	£	s.	d.	
	5	6	8	× 21
			7	
	37	6	8	
			3	
	112	0	0	

52.	£	s.	d.	
	0	9	6	× 17
			4 × 4 + 1 = 17	
	1	18	0	
			4	
	7	12	0	
Add	0	9	6	once top line.
	8	1	6	

53.	£	s.	d.	
	0	1	7	× 11½
			11	
	0	17	5	
Add	0	0	9½	half top line.
	0	18	2½	

⁎ In the last question, 19lb. at 11½d. will amount to just the same thing, if we say 11½lb. at 19d. This method may, in many cases, be applied with considerable advantage. —— Questions 80, 81, 86, 87, and 88, are answered in the same way as question 53.

54.	£.	s.	d.	
	0	17	2¼	× 23
			6 × 4 — 1 = 23	
	5	3	1½	
			4	
	20	12	6	
Ded.	0	17	2¼	once first line.
	19	15	3¾	

55.	£.	s.	d.	
	0	1	10¾	× 25
			5	
	0	9	5¾	
			5	
	2	7	4¾	

56.

$$\begin{array}{lrrrl}
 & \pounds. & s. & d. & \\
 & 0 & 14 & 2 & \times 26 \\
 & & & 5 & \times 5 + 1 =: 26 \\
\hline
 & 3 & 10 & 10 & \\
 & & & 5 & \\
\hline
 & 17 & 14 & 2 & \\
\text{Add} & 0 & 14 & 2 & \text{once first line.} \\
\hline
 & 18 & 8 & 4 & \\
\hline\hline
\end{array}$$

57.

$$\begin{array}{rrrl}
\pounds. & s. & d. & \\
0 & 2 & 6\frac{1}{2} & \times 28 \\
 & & 7 & \\
\hline
0 & 17 & 9\frac{1}{2} & \\
 & & 4 & \\
\hline
3 & 11 & 2 & \\
\hline\hline
\end{array}$$

58.

$$\begin{array}{rrrl}
\pounds. & s. & d. & \\
0 & 17 & 9\frac{1}{2} & \times 24 \\
 & & 6 & \\
\hline
5 & 6 & 9 & \\
 & & 4 & \\
\hline
21 & 7 & 0 & \\
\hline\hline
\end{array}$$

59.

$$\begin{array}{rrrl}
\pounds. & s. & d. & \\
0 & 5 & 3 & \times 27 \\
 & & 9 & \\
\hline
2 & 7 & 3 & \\
 & & 3 & \\
\hline
7 & 1 & 9 & \\
\hline\hline
\end{array}$$

60.

$$\begin{array}{rrrl}
\pounds. & s. & d. & \\
0 & 8 & 4\frac{1}{4} & \times 28 \\
 & & 7 & \\
\hline
2 & 18 & 5\frac{3}{4} & \\
 & & 4 & \\
\hline
11 & 13 & 11 & \\
\hline\hline
\end{array}$$

61.

$$\begin{array}{rrrl}
\pounds. & s. & d. & \\
0 & 2 & 7 & \times 32 \\
 & & 8 & \\
\hline
1 & 0 & 8 & \\
 & & 4 & \\
\hline
4 & 2 & 8 & \\
\hline\hline
\end{array}$$

62.

$$\begin{array}{lrrrl}
 & \pounds. & s. & d. & \\
 & 0 & 1 & 3\frac{1}{4} & \times 30\frac{1}{2} \\
 & & & 10 & \\
\hline
 & 0 & 12 & 8\frac{1}{2} & \\
 & & & 3 & \\
\hline
 & 1 & 18 & 1\frac{1}{2} & \\
\text{Add} & 0 & 0 & 7\frac{1}{2} & \text{(1) half first line.} \\
\hline
 & 1 & 18 & 9 & \\
\hline\hline
\end{array}$$

63.

$$\begin{array}{lrrrl}
 & \pounds. & s. & a. & \\
 & 0 & 1 & 8\frac{1}{4} & \times 34 \\
 & & & 7 & \times 5 - 1 = 34 \\
\hline
 & 0 & 11 & 9\frac{3}{4} & \\
 & & & 5 & \\
\hline
 & 2 & 19 & 0\frac{3}{4} & \\
\text{Deduct} & 0 & 1 & 8\frac{1}{4} & \text{once first line.} \\
\hline
 & 2 & 17 & 4\frac{1}{2} & \\
\hline\hline
\end{array}$$

64.

	£.	s.	d.	
	0	14	9	× 38
			10 × 4—2 = 38	
	7	7	6	
			4	
	29	10	0	
Deduct	1	9	6	twice first line.
	28	0	6	

65.

	£.	s.	d.	
	3	17	7	× 33¼
			11	
	42	13	5	
			3	
	128	0	3	
Add	0	19	4¾	quarter first line
	128	19	7¾	

66.

£.	s.	d.	
46	14	6	× 35
		7	
327	1	6	
		5	
1635	7	6	

67.

oz.	dwt.	gr.	
0	5	9	× 36
		6	
1	12	6	
		6	
9	13	12	

68.

£.	s.	d.	
3	12	0	× 42
		7	
25	4	0	
		6	
151	4	0	

69.

£.	s.	d.	
0	10	6	× 44
		11	
5	15	6	
		4	
23	2	0	

70.

£.	s.	d.	
0	4	4	× 39
		12 + 1 = 13 × 3 = 39	
2	16	4	
		3	
8	9	0	

71.

lb.	oz.	dwt.	gr.	
0	0	12	14	× 48
			8	
0	5	0	16	
			6	
2	6	4	0	

72.

	£.	s.	d.	
	0	3	8	× 7½
			7	
	1	5	8	
Add		1	10	half first line.
	1	7	6	

73.

lb.	oz.	dwt.	gr.	
0	0	6	22	× 40
			8	
0	2	15	8	
			5	
1	1	16	16	

74. £. s. d.
0 6 5½×46
9×5+1=46
2 18 1½
5
14 10 7½
Add 0 6 5½ once first line.
14 17 1

75. £. s. d.
0 13 3½×47
8×6—1=47
5 6 4
6
31 18 0
Deduct 0 13 3½ once first line.
31 4 8½

76. £. s. d.
0 1 11×49¼
7
0 13 5
7
4 13 11
Add 0 0 5¾ quarter first line.
4 14 4¾

77. £. s. d.
0 3 7×52
12+1=13×4=52
2 6 7
4
9 6 4

78. £. s. d.
1 10 2×50½
10
15 1 8
5
75 8 4
Add 0 15 1 half first line.
76 3 5

79. £. s. d.
1 5 9×53
9×6—1=53
11 11 9
6
69 10 6
Deduct 1 5 9 once first line.
68 4 9

80. £. s. d.
0 4 10½×19½
5×4—½=19½
1 4 4½
4
4 17 6
Deduct 0 2 5¼ half first line.
4 15 0¾

81. £. s. d.
0 4 8¾×39
12+1=13×3=39
3 1 5¾
3
9 4 5¼

82.

£.	s.	d.	
1	0	4½	
0	8	7¼	
7	11	0¾	
9	0	0½	
5	8	0½	
3	12	0	× 60¼
		12	
43	4	0	
		5	
216	0	0	
Add 0	18	0	¼ first line.
216	18	0	

83.

£.	s.	d.	
5	16	7	× 68¾
		11	× 6 + 2 = 68
64	2	5	
		6	
384	14	6	
Add 11	13	2	twice first line
2	18	3½	half "
1	9	1¾	quarter "
400	15	1¼	

84.

£.	s.	d.	
0	0	5¾	× 11
		11	
0	5	3¼	

85.

£.	s.	d.	
2	15	0¾	
1	8	6¼	
3	18	10¾	
8	2	5¾	
0	6	6¼	
7	15	11½	× 63½
		9	
70	3	7½	
		7	
491	5	4½	
Add 3	17	11¾	half first line.
495	3	4¼	

[illegible]

87.

£.	s.	d.	
0	5	4	× 7
		7	
1	17	4	

88.

	£.	s.	d.
	1	1	0×11¼
			11
	11	11	0
Add	0	5	3 quarter first line.
	11	16	3

Here the Quarts in 1 hogshead are 252; considered as pence, £1. 1s. 0d.

89.

tons.	cwt.	qr.	lb.
0	2	1	23×81
			9
1	2	0	11
			9
9	18	3	15

90.

	£.	s.	d.
	4	12	7×87¾
			11×8—¼=87¾
	50	18	5
			8
	407	7	4
Deduct	1	3	1¾ ¼ first line.
	406	4	2¼

91.

oz.	dwt.	gr.
10	11	16
8	7	17
18	19	9×12
		12
227	12	12

92.

	gal.	qt.	pt.
	31	2	1×94
			12×8—2=94
	379	2	0
			8
	3036	0	0
Deduct	63	1	0 twice top line
	2972	3	0

93.

lb.	oz.	dwt.	gr.
3	7	15	21×10
			10
36	5	18	18

94.

	£.	s.	d.
	0	11	0¾×85
			12×7+1=85
	6	12	9
			7
	46	9	3
Add	0	11	0¾ once first line.
	47	0	3¾

95.

	£	s.	d.	
	1	18	8	× 121
			11	
	21	5	4	
			11	
	233	18	8	

96.

	£	s.	d.	
	0	19	10¼	× 138
				12 × 11 + 6 = 138
	11	18	3	
			11	
	131	0	9	
Add	5	19	1½	6 times top line.
	136	19	10½	

97.

	£	s.	d.	
	0	17	8¾	× 141
				12 × 12 — 3 = 141
	10	12	9	
			12	
	127	13	0	
Ded.	2	13	2¼	3 times top line
	124	19	9¾	

98.

	£	s.	d.	
	0	15	10½	× 156
				12 + 1 = 13 × 12 = 156
	10	6	4½	
			12	
	123	16	6	

99.

	£	s.	d.	
	0	3	0¾	× 360
				6 × 6 × 10 = 360
	0	18	4½	
			6	
	5	10	3	
			10	
	55	2	6	

100.

	£	s.	d.	
	3	15	4	× 437
				11 × 10 × 4 — 3 = 437
	41	8	8	
			10	
	414	6	8	
			4	
	1657	6	8	
Ded.	11	6	0	3 times top line
	1646	0	8	

101.

	£	s.	d.	
	37	14	5	× 813¼
				9 × 9 × 10 + 3 = 813¼
	339	9	9	
			9	
	3055	7	9	
			10	
	30557	17	6	
Add {	113	3	3	3 times top line.
	9	8	7¼	¼ top line.
	30680	9	4¼	

102.

£	s.	d.	
0	0	$2\frac{3}{4}$	× 560lbs. = 5 cwt.
		8	× 7 × 10 = 560
0	1	10	
		7	
0	12	10	
		10	
6	8	4	

Or thus:—Consider 560lbs. as Farthings, or

	£	s.	d.
	0	11	8×11
			11
As before	6	8	4

103.

£	s.	d.	
0	0	$2\frac{3}{4}$	×112
		8	×7×2=112
0	1	10	
		7	
0	12	10	
		2	
1	5	8	price of 1 cwt.
		11	
14	2	4	

Or thus:—11 cwt. or 1232lbs considered as Farthings, is

	£	s.	d.
	1	5	8×11
			11
As before	14	2	4

104.

	£	s.	d.	
	0	1	8	×365
			6	×6×10+5
	0	10	0	
			6	
	3	0	0	
			10	
	30	0	0	
Add	0	8	4	5 times top line.
	30	8	4	annual expences.
	30	0	0	saved.
	60	8	4	income.

Or thus:—1s. 8d. = 20d.

	£	s.	d.
Then	20	0	0
	10	0	0
	0	8	4
	30	8	4
	30	0	0
	60	8	4

105.

£	s.	d.	
0	12	6	× 1000
		·10	
6	5	0	
		10	
62	10	0	
		10	
625	0	0	

Or thus : — 1000
5
8) 5000
As before £ 625

The reason of this is, because 12s. 6d. = $\frac{5}{8}$ of a pound.

106.

£	s.	d.	
8	1	5½	× 200
		10	
80	14	7	
		10	
807	5	10	
		2	
1614	11	8	

107.

£	s.	d.
2	13	0
3	16	5
2	11	0
3	13	0
4	12	11
8	10	6
25	16	10

108.

£	s.	d.
59	11	0½
13	19	6
2	11	0
1	18	6
1	18	4
1	1	1
80	19	5½

109.

£	s.	d.
3	1	6
7	9	5½
5	19	10½
34	6	10
16	18	4
4	14	0¾
72	10	0¾

Note.—In the Bills of Parcels, the Articles are not here set down, but merely what each amounts to, and then their sums are taken.

As soon as ever a boy is capable of reading the nine digits, he ought to commit to memory the Multiplication Table, even before he learns to write; because this Table is indispensably necessary in all his future calculations, and it cannot be learned too early.

In the spring of the year 1840, the Author discovered a property of the Multiplication Table worthy of notice, which is this:—The sum of 1, 2, 3, 4,

COMPOUND DIVISION.

1.
£. s. d.
9) 29 6 6
3 5 2

2.
£. s. d.
3) 9 10 3
3 3 5

3.
£. s. d.
4) 5 8 8
1 7 2

4.
£. s. d.
5) 7 3 9
1 8 9

5.
£. s. d.
6) 10 5 3
1 14 2½

6.
£. s. d.
7) 29 16 9
4 5 3

7.
£. s. d.
8) 29 4 10
3 13 1¼

8.
£. s. d.
9) 59 18 3¾
6 13 1¾

9.
£. s. d.
10) 14 16 11¼
1 9 8¼(3)

10.
£. s. d.
[illegible]58 6 5½
5 6 0½

11.
£. s. d.
12) 92 5 0
7 13 9

12.
£. s. d.
2) 2 17 3½
1 8 7¾

13.
£. s. d.
3) 40 1 5½
13 7 1¾(1)

14
£. s. d.
4) 45 17 5
11 9 4¼

15.
£. s. d.
5) 48 17 9¾
9 15 6¾

---

to 12, is 78; now 78 × 78 = 6084; and this last number is exactly equal to the sum of all the numbers or products which stand in the 144 cells of the Table. The same property obtains, let the Table extend to any number of times, suppose 20 times 20; the sum of 1, 2, 3, 4, &c. to 20, is 210; then 210 × 210 = 44100, and this number is exactly equal to the sum of all the numbers which stand in the 400 cells, &c. The property was published in most of the Newspapers of the day, and hearing nothing further respecting it, the thing is most probably original. It is also a remarkable fact; in the common Table the sum of the numbers in the first column being 78; if this be involved to the 4th power, we have 35015056, and this result is exactly the same as the sum of all the cubes of the numbers which stand in the 144 cells. This property obtains whatever may be the extent of the Table.

16.
£. s. d.
6) 83 6 2¼
13 17 8¼(3)

17.
£. s. d.
7) 69 5 6¼
9 17 11(5)

18
£. s. d.
8) 164 19 6
20 12 5¼

19.
£. s. d.
9) 122 10 9
13 12 3½(6)

20.
£. s. d.
10) 170 6 5½
17 0 7¾

21.
£. s. d.
11) 162 5 5
14 15 0¼(9)

22.
£. s. d.
12) 526 0 0¼
43 16 8(1)

When two component parts are used, as in the following examples, the whole remainders are set down, after the results, in a parenthesis. In the small Key, the remainder and divisor are written in a fractional form, and sometimes the fractions are reduced to their lowest terms; on this account, learners often imagine the remainders are not right, which gives additional trouble to the tutor to explain the difference.

23.
£. s. d.
3) 107 17 6
5) 35 19 2
7 3 10

24.
£. s. d.
4) 260 2 0
4) 65 0 6
16 5 1½

25.
£. s. d.
3) 59 11 8¾—2
6) 19 17 2¾—5
3 6 2¼(17)

26.
£. s. d.
2) 280 4 9¾—1
10) 140 2 4¾—5
14 0 2¾(11)

27.
£. s. d.
4) 895 5 6
6) 223 16 4½
37 6 0¾

28.
£. s. d.
3) 1202 6 6—0
7) 400 15 6—3
57 5 0¾(9)

29.
£. s. d.
3) 20 19 4¼—2
9) 6 19 9¼—4
0 15 6¼(14)

30.
£. s. d.
3) 10 18 8—2
11) 3 12 10½—0
0 6 7½(2)

31.
£. s. d.
4) 97 10 0¾—3
8) 24 7 6—0
3 0 11¼(3)

32.

£. s. d.
5) 1 5 6¼
7) 0 5 1¼
0 0 8¾

33.

£. s. d.
6) 3089 0 4½—0
7) 514 16 8¾—1
73 10 11½(6)

34.

£. s. d.
4) 79 6 6½—2
11) 19 16 7½—8
1 16 0½(34)

35.

£. s. d.
5) 27 7 8½—0
9) 5 9 6½—2
0 12 2 (10)

36.

£. s. d.
7) 187 1 7—4
7) 26 14 6—1
3 16 4¼(11)

37.

£. s. d.
5) 3489 18 11½
10) 697 19 9½
69 15 11¾

38.

£. s. d.
6) 386 4 3
9) 64 7 4½
7 3 0½

39.

£. s. d.
7) 22 0 10¾—2
8) 3 2 11¾—7
0 7 10¼(51)

40.

£. s. d.
8) 25 13 5¼—5
8) 3 4 2—0
0 8 0¼ (5)

41.

£. s. d.
6) 72 9 10½—0
11) 12 1 7¾—5
1 1 11½(30)

42.

£. s. d.
8) 828 3 5¾—7
9) 103 10 5—2
11 10 0½(23)

43.

£. s. d.
7) 0 5 3—0
11) 0 0 9—3
0 0 0¾ (21)

44.

£. s. d.
9)935 14 6¼—7
9)103 19 4½—0
11 11 0½ (7)

45.

£. s. d.
7) 188 7 0 —6
12) 26 18 1½—6
2 4 10(48)

46.

£. s. d.
9) 5 17 1—4
10) 0 13 0—4
0 1 3½ (40)

47.

£. s. d.
8) 95 5 9¼—5
12) 11 18 2½—10
0 19 10 (85)

48.

£. s. d.
10) 10041 7 3½—0
10) 1004 2 8¾—1
100 8 3¼ (10)

49.

£. s. d.
9) 826 5 2¾—5
12) 91 16 1½—6
7 13 0 (59)

50.

£. s. d.
10) 551 16 9¾—7
11) 55 3 8 —0
5 0 4 (7)

51.

£. s. d.
11) 39 3 8½—9
11) 3 11 2¾—9
0 6 5½ (108

52.

£. s. d.
12) 574 19 0
12) 47 18 3
3 19 10¼

53\.

£ s. d.
3) 14 1 3
5) 4 13 9
10) 0 18 9
0 1 10½

54\.

£ s. d.
3)79 4 11 —2
10)26 8 3½—8
11)2 12 9¾—5
0 4 9½(176)

Here 5×10+8=58; then 58×3+2=176; the whole remainder, the same as if the question had been performed by Long Division.

55\.

£. s. d.
2)4 1 4½
7)2 0 8¼
9)0 5 9¾
0 0 7¾

56\.

£ s. d.
7) 4 14 7 —4
8) 0 13 6 —0
11) 0 1 8¼—4
0 0 1¾(228)

* * *

As the Author of the Arithmetic has not given the method of finding the *whole* remainder when there are *four* divisors, I shall here give an example:—

Divide £7237 4s 10½d. by 2160 —The four divisors are 5, 6, 8, 9, for 5 × 6 × 8 × 9 = 2160.

£ s. d.
5) 7237 4 10½—4 }
6) 1447 8 11½—4 } 24
8) 241 4 9¾—7 }
9) 30 3 1 —4 } 39
3 7 0 (1194)

Here 5× 4+ 4= 24, remainder to the divisor 30;

And 8× 4+ 7= 39, remainder to the divisor 72;

Then 39×30+24=1194, the whole remainder.

After all, the best way for a learner to proceed, would be according to the method of Long Division. He would be less liable to fall into error. The operation by Long Division would require very few figures more. Besides, the remainder would be exhibited at once without any calculation

57.

```
      £.  s.  d.  £.  s.  d.
17)41   5  11 (2   8   7
   34
   --
    7
   20
   ---
   145
   136
   ---
     9
    12
   ---
   119
   119
```

58.

```
      £.  s.  d.  £.  s.  d.
23)76   7   7 (3   6   5
   69
   --
    7
   20
   ---
   147
   138
   ---
     9
    12
   ---
   115
   115
```

59.

```
      £.  s.  d.  £.  s.  d.
31)169  14  6 (5   9   6
   155
   ---
    14
    20
   ---
   294
   279
   ---
    15
    12
   ---
   186
   186
```

60.

```
      £.  s.  d.  £.  s.  d.
47)332  2   8 (7   1   4
   329
   ---
     3
    20
   ---
    62
    47
   ---
    15
    12
   ---
   188
   188
```

61.

```
      £.  s.  d.  £.  s.  d.
[illegible]
```

62.

```
      £.  s.  d.  £.  s.  d.
[illegible]
```

```
63.      £.   s.  d.   £.  s.  d.
     75)983   5   8½ (13   2   2½
        75
        ---
        233
        225
        ---
          8
         20
        ---
        165
        150
        ---
         15
         12
        ---
        188
        150
        ---
         38
          4
        ---
        154
        150
        ---
        (4)
```

```
64.      £.   s.  d.   £.  s.  d.
     86)764   4   8½ (8   17   8¾
        688
        ----
         76
         20
        ----
        1524
         86
        ----
         664
         602
        ----
          62
          12
        ----
         752
         688
        ----
          64
           4
        ----
         258
         258
        ====
```

```
65.  94) 173  12   9¼ (1  16  11¼
          94
         ----
          79
          20
         ----
         1592
          94
         ----
          652
          564
         ----
           88
           12
         ----
         1065
         1034
         ----
           31
            4
         ----
          125
           94
         ----
         (31)
```

66. £. s. d. £. s. d.
98) 2523 9 1¾ (25 14 11¾
196
563
490
73
20
1469
98
489
392
97
12
1165
1078
87
4
351
294
(57)

67. £. s. d. £. s. d.
109) 81 0 10 (0 14 10¼
20
1620
109
530
436
94
12
1138
109
48
4
192
109
(83)

68. £. s. d. £. s. d.
137) 1000 0 0 (7 5 11¾
959
41
20
820
685
135
12
1620
1507
113
4
452
411
(41)

69. £. s. d. £. s. d.
164)2156 19 1 (13 0 7¼
164
493
492
4
20
99
12
1189
1148
41
4
164
164

71 £. s. d. £. s. d.
215)22083 7 0 (102 14 3
215
583
430
153
20
3067
215
917
860
57
12
684
645
(39)

70. £. s. d. £. s. d.
183)100101 9 6¼ (547 0 0½
915
860
732
1281
1281
9 6¼
12
114
4
457
366
(91)

72. £ s. d. £ s. d.
406)12162 12 11¾(29 19 1½
812
4042
654
388
20
7772
406
3712
3654
58
12
707
406
301
4
1207
812
(395)

73. £ s. d. £ s. d.
784) 32860 4 4 (41 18 3¼
3136
1500
784
716
20
14324
784
6484
6272
212
12
2548
2352
196
4
784
784

74. £ s. d. £ s. d.
1012) 361072 [illegible] 3 (356 15 9¼
3036
5747
5060
6872
6072
800
20
16002
1012
5882
5060
822
12
9867
9108
759
4
3036
3036

75. £ s. d.
877 1 3
20
10) 41
12
3) 00
438 10 5 Quotient.

76. £ s. d.
1532 16 3
20
[illegible] 36
12
6 75
4
3 00
513 10 6¾ Quotient.

77.
£ s. d.
97|06 10 7¼
|20
1|30
|12
3|67
|4
2|69
£97 1 3½ (69) Quotient.

78.
£ s. d.
2|50 4 7¾
|20
10|04
|12
0|55
|4
2|23
£2 10 0½ (23) Quotient.

79.
£ s. d.
30)93 17 6
3 2 7

80.
£ s. d.
20)1139 15 10
56 19 9

81.
£ s. d.
60)413 15 0
6 17 11

82.
£ s. d.
80)362 5 0
4 10 6¾

83.
£ s. d.
20)155 19 0¼
7 15 11¼ (13)

84.
£ s. d.
40)1200 7 8
30 0 2¼ (8)

85.
£ s. d.
120) 1581 12 6
13 3 7¼

86.
£ s. d.
5) 5[illegible] 0 0
5) 114 8 0
22 17 7 (4)

87.
£ s. d.
5) 617 16 9¼
5) 123 11 4½
24 14 3¼

WEIGHTS AND MEASURES.

TROY WEIGHT.

88.
lb. oz. dwt.
5)76 9 15
15 4 7

89.
lb. oz. dwt. gr.
3) 16 9 11 8
5 7 3 18 (2)

90.

	oz.	dwt.	gr.
4)	15	13	16
	3	18	10

91.

	lb.	oz.	dwt.	gr.	
5)	52	3	9	15	
	10	5	9	22	(1)

AVOIRDUPOIS WEIGHT.

92.

	cwt.	qr.	lb.	
6)	71	2	7	
	11	3	19	(5)

93.

	tons.	cwt.	qr.	lb.
7)	46	12	1	21
	6	13	0	23

94.

	lb.	oz.	dr.
8)	70	2	8
	8	12	5

95.

	tons.	cwt.	qr.	lb.	
9)	457	15	0	8	
	50	17	0	25	(7)

APOTHECARIES WEIGHT.

96.

	lb.	oz.	dr.
10)	8	11	4
	0	10	6

97.

	lb.	oz.	dr.	sc.	gr.	
11)	19	8	7	0	14	
	1	9	4	0	17	(7)

CLOTH MEASURE.

98.

	yd.	qr.	nl.
12)	50	1	0
	4	0	3

99.

	E. ell.	qr.	nl.	
3)	38	3	1	
	12	4	1	(2)

100.

	yd.	qr.	nl.
4)	330	3	0
	82	2	3

101.

	F. ell.	qr.	nl.	
5)	56	1	3	
	11	0	3	(4)

LONG MEASURE.

102.

	m.	f.	p.	
7)	287	6	31	
	41	0	38	(5)

103.

	yd.	ft.	in.	
8)	636	1	1	
	79	1	7	(5)

104.

```
     yd. ft. in.
  3) 123  1  6
     ----------
  6) 41   0  6
     ----------
      6   2  7
```

105.

```
      L.  m. fur. pl.
  2)  71  0   4   9—1
      ---------------
 11)  35  1   6   4—9
      ---------------
       3  0   5  25 (19)
```

LAND MEASURE.

106.

```
    Ac. r.  p.
  6) 22  2  13—1
     -----------
  6)  3  3   2—2
     -----------
      0  2  20 (13)
```

107.

```
     Ac.  r.  p.
  5) 350  3  35
     ----------
 11)  70  0  31
     ----------
       6  1  21
```

108.

```
     Ac. r.  p.
  9) 44  3  13
     ---------
      4  3  37
```

109.

```
      Ac.  r. p.
 11)  199  1  0
      ---------
       18  0 18 (2)
```

WINE MEASURE.

110.

```
    hhd. g. qt. hhd. g. qt.
53) 299 17  3 ( 5  40  3
    265
    ---
     34
      9
    ---
    306
      7
    ----
   2159
    212
    ----
     39
      4
    ---
    159
    159
```

111.

```
      tuns. hhd. g.
  12) 476   3   40
      ------------
       39   2   61 (1)
```

112.

```
     T. hhd. g.  T. hhd. g. qt.
78) 266  3  54 ( 3  1  43  2
    234
    ---
     32
      4
    ---
    131
     78
    ---
     53
      9
    ---
    477
      7
   ----
   3393
    312
   ----
    273
    234
    ---
     39
      4
    ---
    156
    156
```

```
113.        hhd.  g. pt.
         2) 179  30   2
            ----------
             89  46   5
```

ALE AND BEER MEASURE.

```
114.     Bar. fir. g.        115.      hhd.  g. qt.
      3) 191   3  3              4) 155  49  0
         ---------                  ----------
          63   3  7                  38  52  3

116.     Bar. fir. g.        117.      hhd.  g. pt.
      5) 1564  0  3                6) 327  46  4
         ----------                   ----------
          312  3  2(2)                 54  34  6
```

DRY MEASURE.

```
118.     qr. bu. pk.         119.      ch.  bu. pk.
      7) 62   2  3                8) 159   1  3
         ---------                   ---------
          8   7  1                    19  31  2(7)

120.     qr. bu. pk.         121.      ch. bu. pk.
      9) 89   1  3               10)  8  24  2
         ---------                   ---------
          9   7  1(2)                 0  31  1
```

TIME.

```
122.      d.  hr. mi.  d. hr. mi.
     94)3602  0   30( 38  7  39
        282
        ---
         782
         752
         ---
          30
           6
         ---
         180
           4
         ---
         720
         658
         ---
          62
          60
         ----
         3750
          282
         ----
          930
          846
         ----
         (84)
```

123.

ms. w. d. hr.
11) 56 3 4 15
5 0 4 21

124.

d. hr. mi. d. hr. mi.
166) 138 2 28 (0 19 58
6
828
4
3314
166
1654
1494
160
60
9628
830
1328
1328

125.

mo. w. d. hr.
12) 210 1 2 12
17 2 0 19

I shall here give a method of dividing any sum of money less than £240, by 240, by inspection; for example:—Divide £231 19 7¾ by 240.

£. s. d.
240) 231 19 7¾
0 19 3¾ (223) quotient.

Explanation.—Call the pounds in the dividend pence; 231 pence are 19s. 3d.; and 15s. of the 19 are 3 farthings; the remainder of the dividend is 4s. 7¾d., or 223 farthings; this is the remainder the same as if the question had been performed by Long Division. Or the remainder may be found thus:—240 — 17 = 223, because 19s. 7¾d. wants 17 farthings of a pound, or 240d. The reason of this abbreviation is, because the divisor 240 is equal to the number of pence in a pound.

240) 231 19 7¾ (0 19 3¾
20
4639
240
2239
2160
79
12
955
720
235
4
943
720
(223) remainder.

When the divisor is 960, we must, for a similar reason, call the pounds in the dividend farthings. Taking the same example: 231 farthings are 4s. 9¾d; the remaining part of the dividend in farthings, is 943; hence the 960th part of £231 19 7¾ is £0 4 9¾ and 943 remaining. Work this by Long Division.

QUESTIONS IN DIVISION.

1. 5) 37815
7563

2. 8) 146376
18297

3. 12) 50298
4191 (6)

4. 295365
20
3) 5907300
7) 1969100
281300

5. 38)1079086(28397
76
319
304
150
114
368
342
266
266

6. 4)208157—1
8) 52039—7
6504 (29)

7. 53,0)8609,2(162
53
330
318
129
106
(232)

8. 6,0) 534,0
89

9. 3) 19239
11) 6413
583

10. 8) 68328
9) 8541
949—72nd. part.
936—73rd. „
13 Answer.

73) 68328 (936
657
262
219
438
438

Or thus :—
73 × 72
9
657
8
5256

Then 5256) 68328 (13 as before
5256
15768
15768

11. 672039
29613
12) 701652
58471

12. 1,00)320,00
320

13.

lb. *oz.* *lb.* *oz.*
10089) 146921 1 (14 9
10089
46031
40356
5675
4
22700
4
90801
90801

14.

6) 3972—0
7) 662—4
Miles 94 (24)

15.

93) 4278 (46 less number.
372
558
558

93
46
139 sum.
139
139
1251
417
139
19321
139
173889
57963
19321
2685619 cube of the sum.
901693
1783926 Answer.

93
93
279
837
8649
93
25947
77841
804357
97336
901693 sum of the cubes.

46
46
276
184
2116
46
12696
8464
97336

*** See note page 102.

```
16.              £  s. d.
              6) 34  6  6
                 --------
                  5 14  5
```

```
17.              £  s.  d.
             11) 13  3  6½
                 ---------
                  1  3 11½
```

```
18.    £  s.  d.  £  s.  d.
  19) 43 13  7¼( 2  5  11¾
      38
      --
       5
      20
      ---
      113
       95
      ---
       18
       12
      ---
      223
      19
      ---
       33
       19
      ---
       14
        4
      ---
       57
       57
```

```
19.              £  s.  d.
              3) 57 15 11¼
                 ---------
              5) 19  5  3¾
                 ---------
                  3 17  0¾
```

```
20.       £     s.  d.
     2) 46213   0   0 —0 \
        ---------------    |  3×7+3=24
     7) 23106  10   0 —3  }
        ---------------    |  24×2+0=48
     8)  3300  18   6¾—3 /
         --------------
          412  12   3¾ (48)
```

The science of Algebra points out a remarkably brief method of solving question 15, which is as follows:—

```
    4278 product of the two numbers.
     417 three times the sum of the same.
   -----
   29946
   4278
  17112
 -------
 1783926 Answer, as before.
```

The difference between the cube of the sum, and the sum of the cubes, of any two numbers, is equal to their product multiplied by 3 times their sum.

21.

30766
1027

215362
61532
30766

s. d.
523)31596682(60414 3½
3138

2166 2,0)6041,4 3½
2092 £3020 14 3½

748
523

2252
2092

160
12

1920
1569

351
4

1404
1046

(358)

22.

£ s. d. £. s. d.
1106)20000 0 0(18 1 7¾
1106

8940
8848

92
20

1840
1106

734
12

8808
7742

1066
4

4264
3318

(946)

23.

£. s. d.
7)6 3 8
0 17 8

24.

£. s. d.
3)1 2 3
0 7 5

25.

£. s. d.
5)0 4 9½
0 0 11½

26.

£ s. d.
9)1 15 1½
0 3 10¼ (3)

27.

£ s. d.
6)3 19 6
0 13 3

28.

£ s. d.
3 11 2
6 0 6½
1 13 3

11 4 11½
4

7)44 19 10
6 8 6½ (2)

29.

	£	s.	d.	
	109	15	4¼	× 15
			5	
	548	16	9¼	
			3	
	1646	10	3¾	
	164	6	0¾	
12)	1482	4	3	
	123	10	4¼	
	26	9	7¾	
	150	0	0	
	105	0	0	
	45	0	0	

30.

	£	s.	d.
6)	142	14	1½
	23	15	8¼

31.

	£	s.	d.
11)	3	18	10
	0	7	2

32.

	£	s.	d.
4)	0	19	6
	0	4	10½

33.

	£	s.	d.	
8)	1	1	0	
	0	2	7½	share of each.

34.

	£	s.	d.
12)	18	19	3
	1	11	7¼

35.

	£	s.	d.	
	200	0	0	
	73	0	0	
2)	127	0	0	
	63	10	0	less share.
	73	0	0	
	136	10	0	greater share.

36.

	£	s.	d.	
	47	4	7	
	71	7	1	
	88	8	8	
2)	207	0	4	
	103	10	2	sum of the debts.
	47	4	7	
	56	5	7	C.'s debt.

£	s.	d.	
103	10	2	
71	7	1	
32	3	1	B.'s debt.
103	10	2	
88	8	8	
15	1	6	A.'s debt.

37.

	£	s.	d.
3)	11	8	9
5)	3	16	3
	0	15	3

38.

	£	s.	d.
4)	8	19	6
6)	2	4	10½
	0	7	5¾

39.
£ s. d.
2)68 1 6
7)34 0 9
4 17 3

40.
£ s. d.
8)0 6 0
0 0 9

41.
£ s. d. £ s. d.
13)41 10 6(3 3 10½
39
2
20
50
39
11
12
138
13
8
4
32
26
(6)

42.
£ s. d.
15 13 4
2 0 0
£ s. d.
19)17 13 4(0 18 7
20
353
19
163
152
11
12
136
133
(3)

43.
£ s. d.
5)16 15 0 —0
5) 3 7 0 —1
0 13 4¾ (5)

44.
£ s. d.
6)58 13 0
6) 9 15 6
1 12 7

45.
£ s. d.
3)12 4 9
11) 4 1 7
0 7 5

46.
£ s. d.
7)30 19 6
9) 4 8 6
0 9 10

47.
£ s. d.
7)2 2 3½
10)0 6 0½
0 0 7¼

48.

```
       £   s. d.
   6) 199 10 0
      ---------
   7)  33  5 0
      ---------
  10)   4 15 0 price of 10 gal.
      ---------
        0  9 6
      =========
```

49.

```
      £  s.  d.
   7) 3 11  5½
      ---------
   7) 0 10  2½
      ---------
      0  1  5½
      =========
```

50.

```
       lb. oz. dwt. gr.
    6) 1   0   0    0—0
       ----------------
   11) 0   2   0    0—3
       ----------------
       0   0   3   15 (18)
       ================
```

51.

```
         £   s.  d.
         9   9   0
         1   1   0
       -----------
   12) 10  10   0
       -----------
   12)  0  17   6
       -----------
        0   1   5½
       ===========
```

52.

```
        lb. oz. dwt. gr. lb. oz. dwt gr
   860)76   0   0    0(0   1   1   5
       12
      ----
       912
       860
      ----
        52
        20
      ----
      1040
       860
      ----
       180
         6
      ----
      1080
         4
      ----
      4320
      4300
      ----
        20)
```

53.

```
      yd. ft.  in.
   4) 9    2    2
      -----------
      2    1    3½
      ===========
```

54.

```
            £   s.  d.
   4½ )     1   8   8¼
   2                2
   --       ----------
   9 )      2  17   4½
            ----------
            0   6   4½
            ==========
```

55.

```
                £  s.  d.
   6¼ )         3 17  7¼
   4                  4
   --          ----------
   25      5)15 10  5
               ----------
           5)  3  2  1
               ----------
               0 12  5
               ==========
```

56.

```
      £  s.  d.
   6) 4 16  3
      ---------
   7) 0 16  0½
      ---------
      0  2  3½
      =========
```

57.
lb. oz. dwt. gr.
$46\frac{29}{40}$) 1 0 0 0
40 40
lb. oz. dwt. gr
1869) 40 0 0 0 (0 0 5 3
12

480
20

9600
9345

255
6

1530
4

6120
5607

(513)

58.
£ s. d.
$39\frac{1}{4}$ (29 15 $3\frac{1}{2}$
4 4
£ s. d.
157) 119 1 2 (0 15 2
20

2381
157

811
785

26
12

314
314

59.
£ s. d. £ s. d.
43) 7 7 $9\frac{3}{4}$ (0 3 $5\frac{1}{4}$
20

147
129

18
12

225
215

10
4

43
43

60.
£ s. d.
2) 4 15 8
$2 \times 7 \times 8 = 112$
7) 2 7 10
8) 0 6 10
0 0 $10\frac{1}{4}$

61.
£ s. d. £ s. d.
$112 \times 8 = 896$) 30 16 0 (0 0 $8\frac{1}{4}$
20

616
12

7392
7168

224
4

896
896

62.
£ s. d.
50) 260 8 4
10) 5 4 2
10) 0 10 5
10) 0 1 $0\frac{1}{2}$
0 0 $1\frac{1}{4}$

63.
£ s. d. £ s. d.
93×63=5859)3106 9 9¾(0 10 7¼
20
62129
5859
3539
12
42477
41013
1464
4
5859
5859

64.
oz. dwt. gr.
6)4 18 18
0 16 11

65.
cwt. qr. lb.
7×6=42
7)8 3 7—0
6)1 1 1—3
0 0 23(21)

66.
yd. qr. nl.
10)238 0 2
23 3 1

67.
£ s. d.
7)22 1 0
12)3 3 0
0 5 3

68.
£ s. d. £ s. d.
365)10000 0 0(27 7 11¼
730
2700
2555
145
20
2900
2555
345
12
4140
365
490
365
125
4
500
365
(135)

69.
£ s. d. £ s. d.
977)420 6 3¼(0 8 7¼
20
8406
7816
590
12
7083
6839
244
4
977
977

```
70.        £     s.  d.  £    s.  d.        71.       £    s.   d.
    19) 14357   16   6(755   13   6               7)332   14   9¾
        133                                     6  ─────────────
        ───                                     2  3)47   10   8¾
         105                                    ──  ─────────────
          95                                    12    15  16  10¾ woman's sh.
         ───                                     9                2
         107                                    ──  ─────────────
          95                                    21    31  13   9½ man's share.
         ───                                    ══    ═════════════
          12
           20
         ───
          256
          19
         ───
           66
           57
          ───
            9
           12
          ───
          114
          114
          ═══
72.                             £     s.  d.  £   s.  d.
  27       30          850) 1050    2   1(1   4   8½ a boy's share.
   20       9                850                  9
  ───     ───               ────            ──────────
  540     270                200           11   2   4½ a woman's share.
  270     ───                 20                    3
   40                        ────           ──────────
  ───                        4002          33   7   1½ a man's share.
  850 divisor.               3400           ══════════
  ═══                        ────
                              602
                               12
                             ────
                             7225
                             6800
                             ────
                              425
                                4
                             ────
                             1700
                             1700
                             ════
```

The two last questions properly belong to Algebra, for that science points out exactly the same mode of operation, as that which is given in the Author's 'Occasional Directions.'

When the figure standing in the place of units in the divisor is 1, 3, 7,

QUESTIONS IN REDUCTION.

1.
£
128
20
2560 s.
12
30720 d.

2.
£
350
20
7000 shil.
12
84000 pence.
4
336000 far.

3.
d.
12) 11040
2,0) 92,0
£ 46

4.
£ s. d.
73 4 9¾
20
1464 shil.
12
17577 pence.
4
70311 far.

5.
£ s. d.
20 15 10
20
415 shil.
12
4990 pence.
4
19960 far.

6.
far.
4) 46515—3
12) 11628—0
2,0) 96,9—9
£ 48 9 0¾

---

or 9, and the dividend a multiple of the divisor, the quotient may be determined independently of Long Division, as follows:—

Example.—Divide 287377882 by 367

Operation.—367) 287377882

$$\begin{array}{r l} 2202 & -6 \\ 1468 & -4 \\ 000 & -0 \\ 1101 & -3 \\ 2936 & -8 \\ 2569 & -7 \\ \hline 287377882 & \end{array} \left.\vphantom{\begin{array}{l}1\\1\\1\\1\\1\\1\end{array}}\right\} \text{Quotient.}$$

Explanation.—As 2 stands in the place of units in the dividend, the first figure of the first multiple must be 2, and consequently the multiplier must be 6; the 2nd figure of the dividend being 8, the first figure of the 2nd multiple must be 8, and the multiplier 4, &c. The first figure of any multiple must be such that, by adding the units place of the sum, it be the same as the corresponding figure of the dividend.

7.
£ s. d.
5010 10 0¼
20
100210 shil.
12
1202520 pence.
4
4810081 far.

8.
d.
12) 219124—4
2,0) 1826,0
£ 913 0 4

9.
far.
4) 58130—2
12) 14532
2,0) 121,1—11
£60 11 0½

10.
£ s. d.
4087 13 11½
20
81753 shil.
12
981047 pence.
2
1962095 ½ pence.

11.
£ s. d.
25 3 6
20
503 shil.
2
1007 six-d.

12.
half-d.
2) 25813— 1
12) 12906— 6
2,0) 107,5—15
£53 15 6½

13.
£ s. d.
172 8 8
20
3448 shil.
3
10346 four-d.

14.
six-d.
2) 12229—1
2,0) 611,4—14
£ 305 14 6

15.
three-d.
4) 7830— 2
2,0) 195,7— 17
£ 97 17 6

16.
£ s. d.
210 0 2
20
4200 shil.
6
25201 two-d.

17.
£ s. d.
957 16 9
20
19156 shil.
4
76627 three-d.

18.
guin.
465
7
3255
3
9765 shil.
12
117180 pence.

19\.
cr.
621
5
3105 shil.
12
37260 pence.

20\.
£ *s.* *d.*
43 12 0
10
436 two-sh.

21\.
£ *s.* *d.*
460 8 0
10
14604 two-sh.

22\.
two-s.
1,0) 570,7 — 7
£ 570 14 0

23\.
far.
4) 29040
12) 7260 pence.
5) 605 shil.
4) 121—1 cr.
£ 30 5 0

24\.
£
1730
8
13840 half-cr.
30
415200 pence.

25\.
pence.
12) 46872
7) 3906
7 × 3 = 21
3) 558
186 g.

26\.
eight-d.
21
2
3) 42
14 shil.

27\.
eight-d.
19
2
3) 38 — 2
12s. 8d.

28\.
eight-d.
26
2
3) 52 — 1
17s. 4d.

29\.
eight-d.
401
2
3) 802 — 1
2,0) 26,7 — 7
£ 13 7 4

30\.
pence.
6) 15600
5) 2600 sixpences
2) 520 half-cr.
4) 260 crowns.
£ 65

31\.
£ *s.* *d.*
39 16 $2\frac{3}{8}$
20
796 shil.
12
9554 pence.
8
76435 eighths.

32\.
£ *s.* *d.*
43 17 $0\frac{5}{8}$
20
877 shil.
12
10524 pence.
8
84197 eighths.

33\.
eighths.
8) 202784
12) 25348 — 4
2,0) 211,2 — 12
£ 105 12 4

34.
s. *d.*
13 4
11
146 8
12
1760 pence.

35.
moid.
230
9
2070
3
2,0) 621,0—10
£310 10

36.
shil.
2,0) 318,2—2
159 2
3182 0
£3341 2

37.
crowns.
546
5
7) 2730
3) 390
130 guin.

38.
shil.
3840
2
4,0) 768,0
£192

39.
£ *s.* *d.*
55 16 2
20
1116 shil.
12
13394 pence.

40.
s. *d.*
7 8¼
12
92 pence.
4
369 far.

41.
£ *s.* *d.*
73 13 5
20
1473 shil.
12
17681 pence.

£ *s.* *d.*
5 19 0
20
119 shil.
12
1428 pence.

42.
£ *s.* *d.*
4 1 3
20
81 shil.
4
525 three-d.

£ *s.* *d.*
19 11 6
20
391 shil.
4
1566 three-d.

43.
£ *s.* *d.*
7021 0 4
20
140420
3
421261 four-d.

£ *s.* *d.*
913 12 8
20
18272
3
54818 four-d.

44.
£ *s.* *d.*
71 15 0
4
287 crowns.

£ *s.*
465 10
4
1862 crowns.

45.
£ *s.*
581 6
10
5813 two-s.

£ *s.*
37 16
10
378 two-s.

46.
s. d.
6 9½
12
81 pence.
2
163 half-d.

£
500
20
10000 shil.
12
120000 pence.
2
240000 half-d.

47.
s. d.
10 6
2
21

£194 10s.
20
3890 shil.
2
7) 7780—3 } 10
3) 1111—1 }
370 half-g. 5s. over.

48.
£ s.
346 10
20
7) 6930
3) 990
330 guineas.

49.
s. d.
5 3
4
21 three-d.

£ s. d.
35 11 9
20
711
4
7) 2847—5 } 12
3) 406—1 }
135 q. g. 3s. over.

50.
£ s. d.
8573 14 6
8 + 5 h. cr. = 12 6 (s. d.)
68589 half-cr. 2s. over.

51.
s. d.
4 4
3
13

£239 17s.
20
4797
3
13) 14391
1107 dollars.

52.
d.
52½
2
105

£ s. d.
514 2 11
20
10282
12
123395
2
105) 246790 (2350 cr.
210
367
315
529
525
half-d. 40 = 1 8 over

53.
d.
53⅛
8
425

£ s. d.
451 11 3
20
9031
12
108375
8
425) 867000 (2040 crowns
850
1700
1700

```
54.              £   s.
                48   9
                20
six-d.         ----
 10             969 shil.
  5               2
  2             ----
----       17) 1938 (114 of each.
 17            17
====           ----
                23
                17
                ----
                 68
                 68
                ====
```

```
55.              £      s.  d.
three-d.       14720    4   3
 84               20
 42            -------
 21            294404
----                4
147            -------
====   147) 1177617 (8011 of each
            1176
            -----
              161
              147
              ----
               147
               147
               ====
```

```
56. d.           d.
    30     52) 10288 ( 197 of each
    12          52
     6          ----
     4          508
   ----         468
    52          ----
                 408
                 364
                 ----
                  44d.=3  8 over
                  ====
```

```
57.
six-d.     £     s.
  21      2017   14
  10        20
   5      ------
 ----     40354
  36          2
 ====     ------
       6)80708—2 \
          ------  }32=16s. over
       6)13451—5 /
          ------
          2241 of each.
          ====
```

```
58.   s.  d.          q. guin.
      2   6            130×21
      4                  7
      --               ----
      10 three-d.       910
      ==                  3
                       ----
                1,0) 273,0
                     -----
                     273 half-cr.
                     ====
```

```
59.  s.
     5             558
    12              40 d.=3s. 4d.
    --           ------
    60      6,0) 2232,0
                 ------
                  372 crowns.
                  ====
```

```
60.  4  1     243×54d.=4s. 4d.
    12          9
   ----       ----
    49        2187
   ====          6
             -----
        7) 13122—4 \  d.   s. d.
           -----    }39=3  3 over
        7)  1874—5 /
            ----
            267 dollars.
            ====
```

```
61.              328
                  17
                 ----
            7 ) 5576—4 \
                 ----   } 11
            3 )  796—1 /
                 ----
                 265 guin. 11s.
                 ====
```

62. 21s.
3
63

1000000
13 four-d. = 4s. 4d.
7) 13000000—6
9) 1857142—1
} 13 four-d. = 4s. 4d.
206349 guineas.

63. s. d.
6 $5\frac{4}{8}$
12
77
8
620

s. d.
469 eights—4 $10\frac{5}{8}$
3100
469
1407
62,0)145390,0(2345 mil.
124
213
186
279
248
310
310

64. 250000
400
1,000) 100000,000
100000
$6\frac{1}{2}$ = 6s. 6d.
600000
50000
2,0) 65000,0
£32500

65. lb.
113
12
1356 oz.
20
27120 dwt.
6
162720
4
650880 gr.

66. gr.
4) 344870—2
6) 86217—3
} 14
2,0) 1436,9—9
12) 718 —10
59lb. 10oz. 9dwt. 14gr.

67. lb. oz. dwt. gr.
22 7 0 10
12
271 oz.
20
5420 dwt.
6
32520
4
130090 gr.

68.
gr.
6) 47376
4) 7896
2,0) 197,4—14
12) 98 —2
8lb. 2oz. 14dwt.

69.
lb. *oz.* *dwt.*
83 0 13
12
996 oz.
20
19933 dwt.

70.
lb. *oz.*
5 11½
12
71 oz.
2
143 ½ oz.

lb. *oz.*
619 3
12
7431 oz.
2
14862 ½ oz.

71.
lb. *oz.*
3 8½
10
37 1
12
445 oz.

72.
lb. *oz.* *dwt.* *gr.*
6 0 12 21
12
72
20
1452
6
8712
4
34869
357
244083
174345
104607
12448233 grains.

73.
oz.
2¼
4
9

oz.
8070
4
9)32280—6 or 1½oz.
3586 spoons.

74.
lb. *oz.* *dwt.*
2 11 6
12
35
20
706

lb. *oz.*
29710 10
12
356530
20
706)7130600(10100 bars
706
706
706

75.
lb. *oz.* *dwt.*
21 0 10
2 5 4
0 4 18
23 10 12
12
286
20
5732
3
17196 dwt.

76. *oz. dwt. gr.*
19 16 11
23 18 0
7 0 20
11 6 12
2 12 13
1 19 0
66 13 8
20
1333
6
7998
4
32000 divisor.

480 gr. in 1 oz.
1000
32,000)480,000(15 of each
32
160
160

77. *tons.*
3461
20
69220 cwt.
4
276880 qr.
7
1938160
4
7752640 lb.

78. *cwt. qr. lb. oz. dr.*
3 0 14 0 9
112
350 lb.
4
1400
4
5600 oz.
4
22400
4
89609 dr.

79. *oz.*
4) 471671—3 }
4) 117917—1 } 7
4) 29479—3 }
7) 7369—5 } 23
4) 1052
263 cwt. 23lbs. 7oz.

80. *tons. cwt. qr. lb. oz. dr.*
40 3 3 25 10 7
20
803
4
3215 × 28
7
22505
4
90045 × 16
4
360180
4
1440730 × 16
4
5762920
4
23051687 drams.

81. *lb.*
7) 15420—6 } 20
4) 2202—2 }
4) 550—2
2,0) 13,7—17
6 tons 17 cwt. 2 qr. 20 lb.

82. *cwt.*
57
57
57
57
6384 lbs.

Or thus:— *cwt.*
57
112
114
627
6384

83. *cwt.* *qr.* *lb.*
19 1 8
19
19
1936
2164

84. *cwt.* *qr.* *lb.*
536 3 11
536
536
53695
60127 lb.

Or thus:— *cwt.* *qr.* *lb.*
536 3 11
112
1167 + 95
5896
60127

85. *cwt.* *qr.* *lb.*
7 0 19
777
19
803 lb.

86. *lb.*
2337
2
3) 4674
1558 gt. lb.

3 half-pounds = to 1 great pound.

87. *gt. lb.*
265
3
2) 795
397½ lb.

88. *fother.*
73
19½
1387
Add 36½ half first line.
1423½ cwt.

89. *cwt.*
19½ 390
2 2
39) 780 (20 fother.
78

90. *cwt.* *qr.* *lb.*
13 1 12
13
13
1340
11) 1496
136 canisters.

91.
cwt. *qr.* *lb.*
2 2 13
222
69
293
53
879
1465
15529 lb.

92.
cwt. *qr.*
10 3
10
10
1084
1204 divisor.

lb. *hhd.*
1204)90300(75
8428
6020
6020

93.
cwt. *qr.* *lb.*
2 3 14
222
98
322 lb.
6
1932
2
5)3864—4 }
7) 772—2 } 14 = 7 lb. over.
110 parcels.

lb.
17½
2
35

94.
cwt.
2¼
3¾
4¼
10¾
4
43 divisor.

cwt.
548¼
4
43)2193 (51 of each.
215
43
43

95.
lb. *oz.*
13 13
4
52
4
221

bags.
1378
221
1378
2756
2756
4)304538—2 }
4)76134—2 } 10
4)19033—1 }
7)4758—5 } 21
4)679—3
169 cwt. 3 qr. 21 lb. 10 oz.

96.
lb. *oz.* *dr.* *sc.* *gr.*
3 5 0 1 12
13
41
8
328
3
985
20
4)19712
4)4928
1232 doses.

97.
gr.
2,0) 8083,0—10
3) 4041
8) 1347—3
12) 168
14 lb. 3 dr. 10 gr.

98.
yd. nl.
73 3
4
292
4
1171 nl.

99.
nl.
4) 3308
5) 827—2
165 E. e. 2 q.

100.
nl.
4) 9871—3
3) 2467—1
822 Fl. e. 1 qr. 3 nl.

101.
Fr. e.
58239
6
5) 349434—4
69886 E. e. 4 qr.

102.
yd.
13¼
4
55

qr.
5) 35878—3
11) 7175—3
qr. yd.
18 = 4½
652 pieces 4½ yd.

103.
E. e.
5432
5
4) 27160
6790 yd.

104.
Fl. e.
31 × 24
6
186
4
2) 744
372 Fr. e.

105.
69
31
69
207
2139 × 28
7
14973
4
59892 Fl. e.
3
4) 179676
44919 yd.

106.
8 fur.
40
320 p.
5½ plus half 320
1760 yd.
3
5280 ft.
12
63360 in.
3
190080 b. c.

107.
in.
12) 2851200
3) 237600 feet
79200 yards
2
11) 158400
4,0) 1440,0 poles
8) 360 furlongs
3) 45 miles
15 leagues.

108.
feet
3) 100880—2
33626
2
11) 67252—9 = 4½ yd. plus 2 ft. = 5 yd. 6 in.
4,0) 611,3—33
8) 152
3) 19—1
6 lea. 1 m. 33 pl. 5 yd. 6 in.

109.
pl. yd. ft. in.
33 3 1 8
5½ plus a half yd.
2) 33—½ yard, or 18 in.
184
3
553
12 plus 26 in. = 18 + 8
6662 inches.

Or thus:—
198 inches in 1 pole.
33
594
594
6534
Plus 128 in. in 3 yd. 1 ft. 8 in.
6662 inches.

110.
63360 inches in 1 mile
167
44352
38016
6336
10581120 inches.

111.
ft. *in.*
2 8
12
32

1760 yds. in 1 mile
$2\frac{1}{4}$
3520
440 = $\frac{1}{4}$ first line
3960 × 36
6
23760
6
4) 142560
8) 35640
4455 steps.

112.
yd. *ft.* *in.*
5 1 7
3
16
12
199

63360 in. in 1 mile
386 miles
38016
50688
19008
ft. *in.*
199)24456960(122899 rev. 4 11 over
199
455
398
576
398
1789
1592
1976
1791
1850
1791
59 in. = 4 ft. 11 in.

113.
deg.
34
60
2040 geo. miles.

114.
deg.
58 × $69\frac{1}{2}$
70
4060
Ded $29\frac{1}{2}$ first line.
4031 stat. miles

115.
deg.
$72\frac{1}{2}$
60 plus 30
4350 geo. miles.

116. *deg.*
360 × 69½
70
25200
Ded. 180 half first line.
25020 earth's circumference.
190080 barleycorns in 1 mile.
200160
22518..
2502
4755801600 barley corns.

117. *p.*
4,0) 2850,9—29
4) 712
178 *a.* 29 *p.*

118.

a.	*r.*	*p.*
493	1	1

4
1973
40
999) 78921 (79 shares
6993
8991
8991

119.

a.	*r.*	*p.*	*yd.*
56	2	29	17
38	3	13	25
17	3	15	22¼

4
71
40
4) 2855
30¼
85672¼
713¾
86386 yds. in B's sh.

120. *sq. yd.*
77238
9
695142 × 144
12
8341704
12
100100448 sq. inches

121. 144514892946615009280 × 27
9
13006340365195350683520
3
39019021095586052050560 × 1728
12
46822825314703263006720
12
561873903776439156080640
12
6742486845317269872967680 cubic in.

The result of the last question is expressed in words as follows:—Six quadrillions, seven hundred and forty-two thousand four hundred and eighty-six trillions, eight hundred and forty-five thousand three hundred and seventeen billions, two hundred and sixty-nine thousand eight hundred and seventy-two millions, nine hundred and sixty-seven thousand, six hundred and eighty.

122.
hhd. *g.* *p.*
40 50 3
9
360
7
2570
8
20563 pints.

124.
gal.
257
33
771
771
7) 8481—4 }
6) 1211—5 } 39
201 tier. 39 gal.

126.
butts.
30
2
60
9
540
7
3780
8
30240 pints.
2
7) 60480
8640 of each.

half-pt.
4
2
1
7

123.
gal.
9) 13398—6 }
7) 1488—4 } 42
4) 212
53 tier. 42 gal.

125.
tuns.
13
4
52
9
468
7
3276
8
26208 pints.

Or thus:—
2016 pints in 1 tun.
13 take in bk. fig.
26208 as before.

127.
hhd.
600 = 300 pipes
210
90 = 180 barrels
900 × 63
9
8100
7
56700 gal.
8¼
453600
14175 = ¼
4) 467775—3 }
7) 116943—1 } 7
4) 16706—2
2,0) 417,6—16
208 t. 16 cwt. 2 qr. 7 lb

128.

bar. *fir.* *gal.*
889 2 8
4
3558
9
32030
4
128120 qt.

129.

hhd. *gal.* *pt.*
202 49 7
9
1818
6
10957
8
87663 pints.

130.

pt.
$$\begin{array}{r}8\,)\,78749-5\\ \left.\begin{array}{r}6\,)\,9843-3\\ 9\,)\,1640-2\end{array}\right\}15\end{array}$$
182 hhd. 15 g. 5 p.

131.

qt.
$$\begin{array}{r}4\,)\,266870-2\\ \left.\begin{array}{r}6\,)\,66717-3\\ 6\,)\,11119-1\end{array}\right\}9\end{array}$$
1853 bar. 9 g. 2 qt.

132.

pt.
$$\begin{array}{r}8\,)\,8676-4\\ \left.\begin{array}{r}6\,)\,1084-4\\ 9\,)\,180-0\end{array}\right\}4\\ 4\,)\,20\end{array}$$
5 t. 4 g. 4 pt.

133.

hhd.
24
9
216
6
6) 1296
6) 216
36 bar.

Or thus:—
hhd.
24
3
2) 72
36 bar.

134.

bar.
771
2
3) 1542
514 hhd.

3 half barrels make 1 hhd.

135.

hhd.
37
3
2) 111 half bar.
55½ bar.

136. *qt.*
4) 164768
6) 41192—2 }
9) 6865—7 } 44
762 hhd. 44 gal.

137. *qr.* *bu.* *g.*
82 3 1
8
659
4
2636
2
5273 gal.

140. 64 pints in 1 bush.
11
704
6
4224 pints.

141. *bu.* *pk.*
3 3 7560 × 15
4 5
15 37800
3
4) 113400
6) 28350—0 }
6) 4725—3 } 18
787 ch. 18 bu.

144. 8766 hours in 1 year
300 years = 3 cen.
2629800 hours.

138. *pk.*
4) 12322—2
8) 3080
385 qr. 2 pk.

139. *last.* *qr.* *pk.* *g.*
71 7 3 1
10
717
8
5736
4
22947
2
45895 gal.

142. *d.* *hr.* *mi.*
233 11 20
6
1398
4
5603
60
336200

143. *thirds.*
6,0) 15000000,0
6,0) 250000,0—40
6,0) 4166,6 —26
6) 694—4 }
4) 115—3 } 22
7) 28
4) 4
1 mo. 22 hr. 26 m. 40 s.

145.

```
 1788
  365¼
 ----
 8940
10728
5364
  447 = ¼
 ------
653067 days.
```

146.

```
Dec.. 13 days remaining
Jan... 31
Feb... 29 leap year.
Mar.. 31
Apr... 30
May.. 31
June.. 24
     ---
   7) 189 days
      ---
       27 weeks.
```

THE RULE-OF-THREE, DIRECT.

In solving the questions in the Rule-of-Three, no regard is paid to contractions which are caused by working with the results, found by taking the common measures of numbers.

1.

```
yd.     s.      yd.
6 ----- 24 ----- 73
                  6
                ---
                438
                  4
               ----
            6) 1752
               ----
          2,0) 29,2
               ----
             £14 12
```

2.

```
yd. qr.         s. d.              yd. qr.
7   3 --------- 28 5 ------------- 69  1
4               12                  4
--              ---                ---
31              341                277
==              277                ===
                ----
                2387
               2387
              682
             -----         d.
      31 ) 94457 ( 3047         12)3047—11
             145                   ----
              217             2,0)25,3
                0                 ----
                                £12 13 11
```

In the second example above, 31 and 341, the first and second terms, being each divisible by 31, giving the results 1 and 11; therefore 277 × 11 = 3047, the answer in pence. All contractions are founded on a similar principle.

```
3.  s.       yd.      £  s.
    24———————6———————14 12
                         20
                        ———
                        292
                          6
                        ———
                    4) 1752
                        ———
                     6) 438
                        ———
                         73 yds.
```

```
4.  yd.      £  s.        yd.
    8————————4 16—————————92
             20           12
             ——          ————
             96          1104
             ==             8
                         ————
                     8) 8832
                         ————
                   2,0) 110,4
                         ————
                         £55 4
```

```
5.  £  s.       yd.     £  s.
    4 16————————8———————55 4
    20                  20
    ——                 ————
    96                 1104
    ==                    8
                       ————
                   8) 8832
12×8=96                ————
                  12) 1104
                       ————
                         92 yd.
```

```
6.  yd. qr.      £  s.  d.      yd. qr.
    69  1————————12 13 11————————7  3
    4            20              4
    ———          ———             ——
    277          253             31
    ===           12             ==
                 ————
                 3047
                   31
                 ————
                 3047
                9141
               ——————    d.
        277) 94457 (341
             831
             ————            12)341—5
             1135               ————
             1108            2,0)2,8—8
             ————               ————
              277             £1 8 5
              277             ======
              ===
```

```
7.  £  s.  d.     yd. qr.     s. d.
    12 13 11———————69  1———————28 5
    20             4           12
    ———           277          ———
    253                        341
    12                         277
    ————                       ————
    3047                       2387
    ====                      2387
                              682
                             ——————  qr.
                       3047)94457(31
                            9141      4)31—3
                            ————      —
                             3047     7 yd.3qr.
                             3047     =
                             ====
```

```
8.  oz.       £  s.  d.        oz.
    9—————————2 13  7½—————————23
                     6
              ———————————
              16  1  9
                     4
              ———————————
              64  7  0
         Ded. 2  13  7½ once first 1.
              ———————————
            9)61 13  4½
              ———————————
              £6 17  0½
              ===========
```

10. [illegible] cwt. qr. £ s. d. cwt. qr.

[illegible] —— 4 2 —— [illegible] —— 114 3

4 [illegible] 4

[illegible]

34) [illegible] ([illegible]

335

291

190

204

0

12) [illegible]

2,0) [illegible]

£374 8

11. £ s. d. cwt. qr. £ s.

87 14 [illegible] —— 11 2 —— 874 8

[illegible] 4 20

[illegible] 46 7488

12

[illegible]

[illegible]) [illegible] (459 qr.

4)459—3

114 cwt. 3qr.

12. £ s. yd. £ s.

7 3 —— 11 —— 49 8

20 20

143 988

11

143) 10868 (76 yd

1001

858

858

13. £ s. yd. £ s.

[illegible] 4 —— [illegible] —— 4 16

20

96 = 12X8

[illegible] yd.

```
14.  £   s.     cwt. qr.      £  s. d.
    374  8——————114  3——————27  14  8
         20          4          20
    ------      -----      ------
      7488        459        554
        12        ===         12
    ------                 ------
     89856                  6656
     =====                   459
                          -------
                           59904
                          33280
                         26624
                        --------   gr.
           89856 ) 3055104 ) 34
                   269568         4)34—2
                   -------          --
                    359424        8 cwt. 2 qr.
                    359424        =
                    ======
```

```
15.  qr.     £  s. d.        bu. gr.
      8——————1  14 7——————51  7
                20             8
               ---           ---
                34           415
                12           415
               ---           ----
               415           2075
               ===           415
                            1660
                           ------
                       8 ) 172225—1
                           ------
                      12 ) 21528
                           -----
                     2,0 ) 179,4—14
                           -----
                           £89 14 0 (1)
                           ====
```

```
16.  oz.      s. d.      lb.  oz. dwt.
      1———————5  5———————10   2   16
     20      12          12
     --      --        ----
     20      65         122
     ==      ==          20
                       -----
                        2456
                          65
                      ------
                       12280
                      14736
                     -------
              2,0 ) 15964,0
                    -----
               12 ) 7982—2
                    ----
              2,0 ) 66,5—5
                    ----
                 £33  5  2
                 ========
```

```
17.  lb. oz. dwt.      £   s. d.      oz.
     10   2  16————————33  5  2———————1
     12                20             20
    ----              ----            --
    122               665             20
     20                12             ==
    ----             -----
    2456              7982
    ====                20
                    -------  d.
           2456 ) 159640 ( 65
                  14736
                  -------        12)65—5
                   12280           —
                   12280          5s. 5d.
                   =====          =====
```

```
18.     cwt.           £  s.  d.            cwt. qr. lb.
         1—————————————2  11  7——————————————3   3  21
         4                    9                    4 casks
        --            ----------           ------------
         4            23   4  3            15    3   0
        ==                    7             4
                      ----------           --
                 4 ) 162   9  9            63=9×7
                      ----------           ======
                      40  12  5¼
                      ==========
19.  oz.     £  s.  d.        oz. dwt.
     1 ——— 3  18  10¾ ——— 17  12
     20     20                 20
     —      —                ———
     20     78                352
     ══     12                ═══
          ————
           946
             4
          ————
          3787
           352
          ————
         ' 7574
         18935
        11361
      ——————————
2,0 ) 133302,4—4
      ——————————
  4 ) 66651—3
      —————————
 12 ) 16662—6
      —————————
 2,0 ) 138,8—8
       ———————
     £69  8  6¼ (4)
     ══════════
```

```
20.  yd.    s.  d.       E.e. qr.
     1 ——— 6  11 ——— 95   4
     4     12           5
     —     ——         ————
     4     83          479
     ═     ══           88
                      ————
                      1437
                     3832
                    ——————
              4 ) 39757—1
                  ————
             12 ) 9939—3
                  ————
            2,0 )  82,8—8
                  ————
                £41  8  3¼
                ══════════
```

```
21.  lb.      £  s.  d.       qr. lb.
     14¾ ——— 1  16  10½ ——— 3  19
     4        20                7
     —        ——               ——
     59       36               21
     ══       12                4
            ————             ————
             442              103
               4                4
            ————             ————
            1770              412
            412              ════
            ————
           2124
           708
          ——————        q.
   59 ) 729240 ( 12360
         139        4 ) 12360
         212           ——————
          354      12) 3090—6
            0          ——————
                  2,0 ) 25,7—17
                       ——————
                     £12  17  6
                     ══════════
```

```
22.  s.  d.        qr.       £  s.  d.
     3  11½ ——— 5 ——— 3  11  3
     12                  20
     ——                  ——
     47                  71
      2                  12
     ——                ————
     95                 855
     ══                   2
                       ————
                       1710
                          5
                       ————    qr.
                  95 ) 8550 ( 90
                       855
                       ════
                         4)90—2
                           ——
                           22 yd. 2q.
                           ══
```

```
23.  £     s.  d.    £    s.
     1————3   8————671   5
     4    3         4
     —    —        ————
     4cr. 11 4d.   2685 cr.
     ═    ═        11
                   ————
               4 ) 29535—3
                   ————
               3 ) 7383
                   ————
             2,0 ) 246,1—1
                   ————
                 £ 123 1 3
                   ════
```

```
24.  s. d.    oz.       £   s.  d.
     5  9————1————283  16  8¼
     12                20
     ——               ————
     69               5676
     4                12
     ———              —————
     276              68120
     ═══                  4
                      —————     oz. dwt.
                276)272481 (987   5
                    2484
                    ————      12)987—3
                     2408        ————
                     2208        82   3   5
                     ————        ══════════
                      2001
                      1932
                      ————
                        69
                        20
                      ————
                      1380
                      1380
                      ════
```

```
25.  £   s.     cwt.      £
     127 8————13————574
       5                5
     ————             ————
     637 four-s.      2870 four-s.
     ═══              13
                      ————  cwt. qr. lb.
                637 ) 37310 (58   2   8
                      3185
                      ————
                      5460
                      5096
                      ————
                       364
                         4
                      ————
                      1456
                      1274
                      ————
                       182
                         7
                      ————
                      1274
                         4
                      ————
                      5096
                      5096
                      ════
```

```
26.  lb.      s. d.    cwt. qr. lb.
     14————7  2————7    1   3
              12      777
              —        31
              86      ————
              ═        815
                        86
                      ————
                      4890
                     6520
                     —————
                 2) 70090—0 )           6
                    ————    } 6         4
                 7 )35045—3 )           —
                    ————              14)24(1
                12 ) 5006—2              14
                    ————                 —
               2,0 )  41,7—17            10
                    ————
                     20  17  2¼ (10)
                    ═══════════
```

27. £ s. — *bags.* — £ s.
31 16 — 12 — 100 14
20 — 20
636 — 2014
12
636) 24168 (38 bags
1908
5088
5088

29. £ — *s.* *d.* — £
1 — 9 5¼ — 4011
12 — 455
113 — 20055
4 — 20055
455 — 16044
4) 1825005—1
12) 456251—11
2,0) 3802,0
£ 1901 0 11¼

28. *s.* *d.* — *qr.* — £ *s.* *d.*
6 11 — 4 — 41 8 3¼
12 — 20
83 — 828
4 — 12
332 — 9939
4
39757
4
332) 159028 (479 *qr.*
1328
2622
2324
2988
2988
5) 479—4
95 E. e. 4 qr.

30. £ — £ *s.* — £ *s.* *d.*
1 — 7 7½ — 430 8 4
60 — 12 — 20
four-d. 60 — 91 — 8608
5 — 3
456 — 25825 four-d.
456
154950
129125
103300
6,0) 1177620,0
5) 196270
12) 39254—2
2,0) 327,1—11
£ 163 11 2

31. *yd.* — £ *s.* *d.* — *qr.* *nl.*
1 — 0 17 8 — 1 3
4 — 7 — 4
4 — 4)6 3 8 — 7
4 — 4)1 10 11
16 — 0 7 8¾

32. *£ s. lb. £ s. d.*
5 19——7——59 2 6¾
20 20
119 1182
12 12
1428 14190
4 4
5712 56763
7 *lb. oz.*
5712) 397341 (69 9
34272
54621
51408
3213
4
12852
4
51408
51408

33. *cwt. s. cwt. qr. lb.*
1——31——17 0 17
4 17
17
4 1717
7
1921 lb.
28 31
4
1921
112 5763
2) 59551—1
112 { 8) 29775—6
7) 3721—11¼
2,0) 53,1—8¼$\frac{6}{7}$
£26 11 8¼$\frac{6}{7}$

Perhaps the best way would be to divide by 112 at once.

34. *E.e. s. d. yd.*
1——4 11½——31¼
5 12 4
5 59 125
4 11
238 1375
238
11000
4125
2750
5) 327250
4) 65450—2
12) 16362—6
2,0) 136,3—3
£68 3 6½

35. *doz. s. d. gr. doz.*
12——7 3——51 7
12 12
87 619
87
4333
4952
12) 53853—9
12) 4487
2,0) 37,3—11
£18 13 11¾

d.
9
4
12)36
3

36. *s. d.* £ £ *s. d.*
9 5¼——1——1901 0 11¼
12 20
113 38020
4 12
455 456251
4
£
455) 1825005 (4011
1820
500
455
455
455

37. *cwt. lb.* £ *s. d. q.* *cwt.*
17 17——26 11 8 1$\frac{6}{7}$——1
17 20 4
17 4
1717 531 7
12
1921 lb. 28
6380 4
4
112
25521
7
178653
112
357306
1965183
1921) 20009136 (10416
1921
7)10416
7991
7684 4) 1488
3073 12) 372
1921
2,0)3,1—11
11526
11526 £1 11

38. £ *s.* £ *s. d.* £
671 5——123 1 3——1
4 20 4
2685 cr. 2461 4
12
29535
4
d.
2685) 118140 (44
10740
12) 44—8
10740
10740 3s. 8d.

39. months £ *s. d.* months
3——388 17 6——8
8
3) 3111 0 0
1037 0 0

40. £ *s. d.*
64——[illegible] 0 0——7
7
8) [illegible] 0 0
8×8=64
8) [illegible] 7 6
£ [illegible] [illegible] [illegible]

```
41.  lb.       d.        cwt. qr. lb.    42.  lb.     s.  d.      cwt. qr. lb.
     20 ——— 3 ——— 67   1  13                 8 ——— 3  6 ——— 2    2   9
                    67                                 12          222
                   67                                  —            65
                  6741                                 42          ———
                  ————                                 =           289 × 42
                  7545                                               7
                     3                                             ————
                ———————           d.                               2023
          2,0 ) 2263,5—15         15                                  6          2
                ———————            4                               ————          4
           12 ) 1131—3             —                          8 ) 12138—2        —
                 ————          2,0)6,0                            ————        8)8
             2,0)9,4               —                         12 ) 1517—5         —
                 ————              3                              ————           1
               £4 14 3¾            =                        2,0 ) 12,6—6
                                                                  ————
                                                                £6  6  5¼
```

```
43.  lb.        s. d.    cwt. qr. lb.    44.  a.          £ s. d.       ac.  r.  p.
     112 ——— 15 2 ——— 3   0   7               1 ——————— 1 5 2 ——— 279   3  15
              12        333                   4           20           4
             ———          7                   —           —          ————
             182        ———                   4           25         1119
             ===        343                   40          12           40
                        182                   —           —          ————
                        ———                   160         302        44775
                        686                   ===         ===          302
                       2744                                          —————
                       343                                           89550
                      —————                                         134325
                      62426                                         ———————
                         30                                    ⎧ 4) 1352205,0
                   ——————————                                  ⎪    ———————
          2 ) 1872780—0 ⎫                               16,0 ⎨ 4 ) 338051 —¼
              ———————   ⎪                                      ⎪    ———————
           7 ) 936390—0 ⎬28                                    ⎩12)  84512—¾ ¼
              ———————   ⎪                                            ————
           8 ) 133770—2 ⎭        28                         2,0 ) 704,2—8
              ———————             4                              ————
          12 ) 16721—5          ————                         £352  2  8¾  ¼
                ————        112) 112 ( 1                     ============
            2,0 ) 139,3—13       112
                  ————           ===
               £69  13  5¼
```

```
45.  yd.     s. d.       yd. qr.
      3 ———— 8  8 ———— 23  3
      4     12           4
     ——     ——          ——
     12    104          95
     ==     ==           5
                       ———
                       475
                       104
                       ———
                      1900
                      475
                    —————        8
              12 ) 49400—8       4
                   —————        ——
               12 ) 4116    12) 32 (2
                    ————        ——
            2,0 ) 34,3--3        8
                  ————          ==
                 £ 17  3  0½
                 ==========
```

```
46.  lb.         £   s.  d.        lb.
     112 ———— 4  17  4 ———— 120
              20                17
              ——               ————
              97               2040
              12               ====
            ————
            1168
             2040
           —————
             4672
            2336
           —————
       2 ) 2382720—0 ⎫
           ———————   ⎪
       7 ) 1191360—2 ⎬ 32              32
           ———————   ⎪                  4
        8 ) 170194—2 ⎭                ————
            ——————                 112) 128 (1
        12 ) 21274—10                   112
             —————                     ————
       2,0 ) 177,2—12                    16
             —————                     ====
           £ 88  12  10¼ (16)
           ==================
```

```
47.  lb.         £   s.  d.        cwt. qr. lb.
     112 ———— 2  18  3 ———— 2   3  16
              20                222 qr. lb.
              ——                100  3  16
              58                ————
              12                324
            ————                ====
             699
             324
            ————
            2796
           1398
          2097
          ——————
          226476
               9
          ——————
     2 ) 2038284—0 ⎫
         ———————   ⎪
     7 ) 1019142—5 ⎬ 108           108
         ———————   ⎪                 4
      8 ) 145591—7 ⎭               ————
          ——————              112) 432 (3
      12 ) 18198—6                  336
           —————                   ————
     2,0 ) 151,6—16                  96
           —————                    ====
         £ 75  16  6¼ (96)
         =================
```

```
48.  pk.     s. d.        qr. pk.
      4 ———— 4  3 ———— 77  3
             4             8
            ——           ————
            17            616
            ==              4
                         ————
                         2467
                           17
                        ——————            d.
                    4 ) 41939—3           3
                        ——————            3
                    4 ) 10484             ——
                        —————           4)9
                  2,0 ) 262,1—1           ——
                        —————             2¼
                     £ 131  1  2¼         ==
                     ============
49. bu.     £  s.  d.      ch. bu.
    36——1  12  10——69  32
        20              6
        ——             ——
        32            414
        12              6
        ——            ———
       394           2516
       ═══            394
                     ————
                    10064
                   22644
                   7548
                   ——————
36=6×6       6)991304—2 )
              ————————   }8
            6 ) 165217—1 )
              ————————
           12 ) 27536—8
              ———————
          2,0 ) 229,4—14
                ———
              £114 14 8 (8)
              ═════════════
```

```
50. cwt.        £   s.  d.       cwt.
    19½ ——— 14  14  0 ——— 173
     2       20                 2
    ——      ———               ———
    39      294               346
    ══      346               ═══
           ————
           1764
          1176
          882
         —————            s.   d.
    39 ) 101724 ( 2608  3½
          78
          ———
          237    2,0 ) 260,8—8
          234           ————
          ———         £ 130  8  3½(30)
           324          ══════════
           312
           ———
            12
            12
           ———
           144
           117
           ———
            27
             4
           ———
           108
            78
           ———
            30
```

```
51.  cwt.      £   s.      cwt. qr. lb.
      21——15 18——129  3   3
      21     20       129
     21      ——      129
    21      318    12987
    ————    ═══    —————
    2352           14535
    ════             318
                  ——————
                  116280
                  14535
                 43605
                ———————          s.  d.
   2352 ) 4622130 ( 1965 2¼
          2352
          —————
          22701
          21168
          —————
           15333
           14112
           —————
            12210
            11760
            —————
              450
               12
             ————
             5400
             4704
             ————
              696
                4
             ————
             2784
             2352
             ————
              432
             ════

2,0) 196,5—5
     ————————
   £98 5 2¼ (432)
   ══════════════
```

```
52.  s.  d.          dwt.          £    s.   d.
     5   9 ———————— 20 ——————— 260   2   3¼
    12                            20
    ——                          ————
    69                          5202
     4                            12
   ———                         —————
   276                         62427
   ===                             4
                              ——————
                              249711
                                  20
                             ———————
                      276 ) 4994220 ( 18095
                            276
                            ————
517) 18095 (35 ing. ans.    2234
     1551                   2208
     ————                   —————
      2585                   2622
      2585                   2484
      ====                  —————
                              1380
                              1380
                              ====

53.  ft. in.    ft. in.     ft.          54.  gal.      £   s.  d.       gal
      7   9 ——— 6   5 ——— 232                 4 ———— 0   7   6 ——————— 6
     12        12          12                                  6
     ——        ——        ————                         ——————————
     93        77        2784                      4 ) 2   5   0
                           11                         ——————————
                        —————                         £ 0  11   3
                        30624                         ==========
                            7
                        ————— in.
                93 ) 214368 ( 2305
                     186
                     ———     12) 2305—1
                      283        ————
                      279        192 ft. 1 in. (3)
                      ———        =================
                       468
                       465
                       ———
                         3
                       ===
```

In the 53rd. question, the remainder and divisor expressed in a fractional form stand thus, $\frac{3}{93}$; the terms of this fraction being divided by 3, it becomes $\frac{1}{31}$. It stands in this form in the small Key.

THE RULE-OF-THREE, INVERSE.

1. *d.* *m.* *d.*
45——4——18
45
18) 180
10 men.

2. £ *s.* *d.* £ *s.*
350 10——51——105 3
20 20
7010 2103
51
701
3505
2103) 357510 (170 days.
2103
14721
14721

3. *ft.* *in.* *ft.* *in.* *ft.* *in.*
18 3——23 6——1 6
12 12 12
219 282 18=6×3
219
2538
282
564
3) 61758
6) 20586
12) 3431 inches.
3) 285—11
95 yd. 11 in.

4. *men.* *d.* *men.*
10——18——4
10
4) 180
45 days.

5. *mo.* *oz.* *mo.*
3——14——5
3 2
16
5) 42—2
5) 32—2
8 oz. 6dr.(2) 6

6. *hr.* *d.* *hr.*
16——16——12
16 4
12
12) 256—4
12)48
21 d. 4 h. 4

```
7.   s. d.     oz. dr.     s. d.
     6  4————7  14————4  6
     12         4          12
     ——        ——          ——
     76         28         54=9×6
     ==          4         ==
              ————
               126
                76
              ————
               756
               882
              ————
        6 ) 9576—0 )
             ————   } 18
        9 ) 1596—3 )
             ————
         4 ) 177—1 )
             ————   } 1
          4 ) 44—0 )
              ——
         11 oz. 1 dr. (18)
```

```
8.    cwt. qr.     m.     cwt. qr. lb.
       7   3————76————4    0   21
      777                444
       84                 21
      ————               ————
      868                469
       76                ====
      ————
      5208
     6076
      ————  m.
469 ) 65968 ( 140
      469
      ————
      1906
      1876
      ————
       308
       ====
```

```
9.   mo.          men.          mo.
     5————————3456————————9
                 5         3456
            —————          1920
       9 ) 17280           ————
            —————          1536 men.
             1920          ====
             ====
```

```
10.   in.          yd.          in.
      36————————1————————8
       1                   4
      ——                   2
  8 ) 36                  ——
      ——              8 ) 8
      4½ yd.              ——
                           1
```

```
11.     oz. dr.    s. d.    oz. dr.
         7  14————6  4————11  1⅓
         4        12         4
        ——        ——        ——
         28       76         44
          4       ==          4
        ————                ————
        126                  177
          3                    3
        ————                ————
        378                  532
         76                  ====
        ————
       2268
      2646
       ————  d.
532)28728 ( 54
      2660
       ————   12 ) 54—6
       2128        ——
       2128        4s. 6d.
       ====        ====
```

```
12.   yd. qr.    yd. qr.    qr.
       1   3————3   2————3
       4         4
      ——        ——          2
       7        14          4
                 7         ——
                ——    3 ) 8—2
           3 ) 98—2        ——
                ——          2
            4 ) 32         ==
                ——
             8 yd. 2nl. (2)
             ==========
13.   s.  d.       lb.        d.
      9   6--------23--------9½
     12                       2
    ----                     --
    114                      19
      2                      ==
    ----
    228
     23
    ----
    684
   456
   ----  lb.
19)5244(276
   38
   ----
   144
   133
   ----
    114
    114
    ===
```

```
14.   s.  d.                 s.  d.
      3   5 -------92--------1   11
     12            20       12
     --           ----      --
     41          1840yd     23
     ==            41       ==
                 ----
                 184
                736
                ----   yd.
          23) 75440 ( 3280
              69
              ---
               64
               46
              ---
               184
               184
               ===
```

```
15.          £    s.      pieces       £    s.
            22   15---------53--------18    4
            20                        20
           ----                      ----
           455                        364
            53                        ===
           ----
           1365
          2275
          -----
   364 ) 24115 ( 66¼ pieces
          2184
          ----
          2275
          2184
          ----
            91
             4
          ----
           364
           364
           ===
16.          ft.  in.
             21   9½
             15   7
             ---------
             37   4½
                  2
             ---------
             74   9  perimeter of the room.

 ft.  in.          ft.  in.          in.
  8   1½———————————74   9————————————22½
 12                12                 2
 --                ---                --
 97               897                45=5×9
  2               195                ==
----              ---
195              4485
===             8073
                897
               ------
            5 ) 174915
               ------
             9 ) 34983
                -----
            12 ) 3887—11
                 ----
              3 ) 323—2
                  ----
                  107 yd. 2 ft. 11 in.

in.          s.  d.          yd.  ft.  in.
12———————————1   3———————————107   2   11
            12                 3
            --               ---
            15=5×3           323
            ==                12
                             ----
                             3887
                                5
                            -----
                            19435
                                3                9
                            -----                4
                  12 ) 58305—9                  --
                       -----              12 ) 36
                   12 ) 4858—10                 --
                        ----                     3
                 2,0 ) 40,4—4                   ==
                       ----
                    £ 20  4  10¾ value of the paper.
```

THE DOUBLE RULE-OF-THREE.

1. *men.* *ac.* *men.*
* 3——17—— 7 Direct.
da. *da.*
* 5——×——12 Direct.

```
  3          17           3
  5           7           4
  —          ——           —
 15         119          12
 ══          12          40
            ———          ——
    3 ) 1428—0 ⎫       15)480(32
        ———    ⎬3         45
    5 ) 476—1  ⎭          ——
        ———               30
       95 ac. 32 p.       30
       ══════             ══
```

2. *men.* *£* *s.* *men.*
* 5——18 15——16 Direct.
w. *w.*
* 12—— × ——20 Direct.

```
  5      18 15
 12         20
 —         ——
 60        375
 ══         16
          ————
          6000
            20
         —————
 6,0) 12000,0
      ———————
  2,0 ) 200,0
        —————
        £100
        ════
```

3. *ac.* *men.* *ac.* *pl.*
* 17—— 3 ——95 32 Direct.
da. *da.*
5——×——* 12 Inverse.

```
  17              95 32
   4               4
   —              ———
  68              380
  40               40
 ————            —————
 2720            15232
   12                3
 —————           —————
 32640           45696
 ═════               5
                 —————
       32640 ) 228480 ( 7 men.
               228480
               ══════
```

4. *bu.* *da.* *bu.*
*80——74——105 Direct.
hor. *hor.*
12——×——* 9 Inverse.

```
              105
   80          74
    9         ———
  ———         420
  720         735
  ═══        ————
             7770
               12
            —————
      8 ) 9324,0—4 ⎫          36
 72,0     ———      ⎬36         2
      9 ) 1165 —4  ⎭           —
          ———               72 ) 72 ( 1
          129½ days              72
          ═════════              ══
```

5. *men.* *w.* *men.*
5 —— 12 —— * 16 Inv.
£ *s.* £
* 18 15 —— × —— 100 Direct.

20
375
16
6000

100
20
2000
12
24000
5
6000) 120,000
20 weeks.

6. *mi.* *da.* *mi.*
* 160 —— 3 —— 1000 Direct.
hr. *hr.*
11 —— × —— * 15 Inverse.

160
15
2400

1000
11
11000
3
24,00 4)330,00—2 } 18
6) 82 —4
13d. 11h. 15m.

18
15
hr. *mi.*
24)270(11 15
24
30
24
6
60
360
24
120
120

7. *men* *lb.* *men*
* 300 —— 3450 —— 175 Direct.
da. *da.*
* 18 —— × —— 26 Direct.

300
5400

3450
175
1725
2415
345
603750
26
362250
120750
54,00 6) 156975,00—3 } 51
9) 26162 —8
2906 lb. 15 oz. (6)

51
16
54) 816 (15
54
276
270
6

8. £ £ £
* 100 —— 5 —— 450 Direct.
yr. *yr.*
* 1 —— × —— 3 Direct.

100
100

450
5
2250
3
1,00) 67,50
£ 67 10

50
20
1,00) 10,00
10

```
9.  cwt. qr.    £  s.      cwt. qr.
   * 15  2 ——— 3  10 ——— 57  3 Direct
       mi.                  mi.
   *   20  ———  ×  ———  172  Direct
     15  2     3 10     57  3
      4        20        4
     ———       ——      ————
     62        70       231
     20        ══       172
    ————               ————
    1240                462
    ════               1617
                       231
                      ——————
                      39732
                         70
                ——————————       s.   d.
     124,0 ) 278124,0 ( 2242    11
             248
             ———
              301        2,0 ) 224,2—2
              248              ———————
              ———          £ 112  2  11 (28)
               532
               496
               ———
                364
                248
                ———
                116
                 12
                ————
                1392
                1364
                ————
                  28
                  ══
```

```
10.  da.        men        da.
     10 ———————— 9 ———— * 25 Inverse.
     yd.                   yd.
   * 12 ———————— × ————   80 Direct.
     25          80
     ——           9
     300         ——
     ═══         720
                  10
                ————
       3,00 ) 72,00
               ————
              24 men.
              ═══════
```

```
11.   oz.       d.          lb.  oz.
    * 9 ——— 3¾ ———————— 2   4 Direct.
      s.                    s.  d.
    * 5 ——— × ————————— 4   2 Direct.
     12                 2   4
     ——      3¾        16          4   2
     60      4         ——          12
      9      ——        36          ——
    ————     15        15          50
     540     ══       ————         ══
     ═══               540
                        50
                     ———————
                   6 ) 2700,0
    54,0              ————
                   9 ) 450
                      ————
                    4 ) 50—2
                       ————
                   12 ) 12
                       ————
                        1s. 0½d.
                       ═════════
```

```
12.    £         £  s. d.        £
    * 100 ——— 4  2  6 ——— 760 Direct.
      yr.                    yr.
    *  1 ———    ×    ———   5½  Direct.
       2       4  2  6       2
       —        20           ——
       2        ——           11
      100       82           ══
     ————       12
      200      ————
      ═══       990
                760
               ————
                594
               693
              ————————
              752400
                  11
             ————————
    2,00 ) 82764,00
            ————————
       12 ) 41382—6
            ————————
       2,0 ) 344,8—8
             ————————
           £ 172  8  6
           ═══════════
```

13. *ft.* *men* *ft.*
* 40 —— 18 —— 360 Direct.
* 3 —— × —— 8 Direct.
* 16 —— × —— 10 Direct.
da. *da.*
12 —— × —— 60 Inverse.

40 360
3 18

120 6480
16 8

1920 51840
60 10

115200 518400
12

1152,00) 62208,00 (54 men.
5760

4608
4608

14. *in.* *in.*
18——1340——* 12 Inverse.
10—— × ——* 12 Inverse.

1340
18

24120
10 12
12
12) 241200
144 divisor.
12) 20100

1675 squares.

sq. *s.* *d.* *sq.*
1 —— 2 6½ —— 1675
12 122

30 3350
4 20100

122 4) 204350—2

12) 51087—3

2,0) 425,7—17

£ 212 17 3½

```
15.    £           £           £
    * 100 ——— 4 ——— 500 Direct.
       w.                w.
    * 52 ———×——— 14 Direct.
       100        500
       ———          4
      5200        ———
      ════       2000
                   14
                 ———      £   s.   d.
   52,00 ) 280,00 ( 5   7   8¼
           260
           ———
            20
            20
           ———
           400
           364
           ———
            36
            12
           ———
           432
           416
           ———
            16
             4
           ———
            64
            52
           ———
            12
           ═══
```

```
16.    ft.          £          ft.
    * 150 ——— 3 ——— 54 Dir.
       st.                st.
    * 3 ———×——— 8 Dir.
       mi.                mi.
    * 40 ———×——— 25 Dir.
     150                  54
       3                   3
     ———                 ———
     450                 162
      40                   8
     ———                 ———
   18000                1296
   ═════                   5
                         ———
                        6480
                           5
                        ———      £   s.
180,00          180 ) 324,00 ( 1   16
                      180
                      ———
                      144
                       20
                      ———
                      2880
                      180
                      ———
                      1080
                      1080
                      ════
```

```
17.       £          £          £
      * 100 ——— 5 ——— 380 Direct.
         da.                da.
      * 365 ———×——— 146 Direct.
          100       380     146
        ———           5      1900
        36500       ———     ———
        ═════       1900    1314
                    ════     146
                            ———      £   s.
              365,00 ) 2774,00 ( 7   12
                       2555
                       ———
                        219
                         20
                       ———
                        4380
                         365
                       ———
                         730
                         730
                        ════
```

18. *men.* —— *d.* —— *men.*
224 —— 5½ —— * 24 Inverse.
hr. —— —— *hr.*
11 —— × —— * 9 Inverse.
yd. —— —— *yd.*
* 231 —— × —— 357 Direct.
ft. —— —— *ft.*
* 7 —— × —— 9 Direct.
* 11 —— × —— 15 Direct.

231	5½	224
7	2	11
1617	11	2464
11		11
17787		27104
9		357
160083 × 24		189728
4		135520
		81312
640332		
6		9676128
		9
3841992		
		87085152
		15

3841992) 1306277280 (340
11525976
15367968
15367968

2)340
170 days.

The first stating is Inverse, because less men require more time. The second stating is also Inverse, because shorter the days are, and a greater number is required to perform any work.

⁂ Modern Arithmeticians would state the first question in the Rule-of-Three Direct thus:— yds. 6 : yds. 73 : : s. 24 : s. 292; comparing yards with yards, and money with money, &c.; this is said to be according to Euclid, who invariably compares lines with lines, surfaces with surfaces, &c.; but let it be remembered, since numbers are the representatives of geometrical quantities, a number expressing yards may be compared with a number expressing shillings with equal propriety, and such comparison, it is presumed, is quite scientific.

PRACTICE.

In the first of the following examples the price is considered 6d. per yard, which gives the amount £179 12s. 6d, then $\frac{1}{12}$ of this is £14 19s. 4½d., the amount at ½d. per yard. After all, it is nothing more than reducing 7185 half-pence to pounds, and the readiest way is to divide by 2, 12, 20. In the fifth example the remainder 77 may be considered either pounds or two-pences.

1.	*d.* 6	$\frac{1}{40}$	718,5—25
	½	$\frac{1}{12}$	179 12 6
			£ 14 19 4½
2.	*d.* 6	$\frac{1}{40}$	85,7—17
	½	$\frac{1}{12}$	21 8 6
			£ 1 15 8½
3.		12	1738—10
		2,0	14,4
			£ 7 4 10
4.	*d.* 3	$\frac{1}{80}$	510,3—63
	1½	½	63 15 9
			£ 31 17 10½
5.	*d.* 2	$\frac{1}{120}$	823,7—77
			£68 12 10
6.	*d.* 2	$\frac{1}{120}$	44,6—86
	½	¼	3 14 4 0 18 7
			£ 4 12 11
7.	*d.* 3	$\frac{1}{80}$	477,2—52
			£ 59 13 0
8.	*d.* 3	$\frac{1}{80}$	601,9—19
	½	⅙	75 4 9 12 10 9½
			£ 87 15 6½
9.	*d.* 4	$\frac{1}{60}$	97,4—14
			£ 16 4 8
10.	*d.* 4	$\frac{1}{60}$	610,1—41
	½	⅛	101 13 8 12 14 2½
			£ 114 7 10½
11.	*d.* 4	$\frac{1}{60}$	78,8—8
	1	¼	13 2 8 3 5 8
			£ 16 8 4
12.	*d.* 6	$\frac{1}{40}$	70,3—23
	½	$\frac{1}{12}$	17 11 6 1 9 3½
			£ 16 2 2½

15	9	4
7	14	8
0	19	4
£24	3	4

27.	d. 1	1/12	1900 158 4
	s. 1	1/20	205,8 4
			£ 102 18 4
28.	d. 1½	1/8	715 89 4½
	s. 1	1/20	80,4 4½
			£ 40 4 4½
29.	d. 2	1/6	1477 246 2
	s. 1	1/20	172,3 2
			£ 86 3 2
30.	d. 15	1/16	513—1
	½	1/30	32 1 3 1 1 4½
			£ 30 19 10½
31.	d. 15	1/16	381—13
			£ 23 16 3
32.	d. 15	1/16	1311—15
	½	1/30	81 18 9 2 14 7½
			£ 84 13 4½
33.	d. 16	1/15	511—1
			£ 34 1 4

34.	s. 1	1/20	52,1
	d. 4 ½	1/3 1/8	26 1 0 8 13 8 1 1 8½
			£35 16 4½
35.	d. 20	1/12	819—3
	3	1/80	68 5 0 10 4 9
			£ 58 0 3
36.	d. 20	1/12	215—11
	2½	1/8	17 18 4 2 4 9½
			£ 15 13 6½
37.	s. 1	1/20	73,7
	d. 6	½	36 17 0 18 8 6
			£ 55 5 6
38.	s. 1	1/20	71,9
	d. 6 ½	½ 1/12	35 19 0 17 19 6 1 9 11½
			£ 55 8 5½
39.	d. 20	1/12	305—5
	1	1/20	25 8 4 1 5 5
			£ 24 2 11

40.	*d.* 20	$\frac{1}{12}$	6101—5
	½	$\frac{1}{40}$	508 8 4 12 14 2½
			£ 495 14 1½
41.	*d.* 20	$\frac{1}{12}$	725—5
			£ 60 8 4
42.	*d.* 20	$\frac{1}{12}$	1171—7
	½	$\frac{1}{40}$	97 11 8 2 8 9½
			£ 100 0 5½
43.	*d.* 20	$\frac{1}{12}$	3003—3
	1	$\frac{1}{20}$	250 5 0 12 10 3
			£ 262 15 3
44.	*d.* 20	$\frac{1}{12}$	923—11
	1 ½	$\frac{1}{20}$ ½	76 18 4 3 16 11 1 18 5½
			£ 82 13 8½
45.	*d.* 20	$\frac{1}{12}$	1676—8
	2	$\frac{1}{10}$	139 13 4 13 19 4
			£ 153 12 8
46.	*d.* 15	$\frac{1}{16}$	815—15
	7½	½	50 18 9 25 9 4½
			£ 76 8 1½

47.	*d.* 20	$\frac{1}{12}$	1070—2
	3	$\frac{1}{80}$	89 3 4 13 7 6
			£ 102 10 10
48.	*d.* 20	$\frac{1}{12}$	7924—4
	3 ½	$\frac{1}{80}$ $\frac{1}{6}$	660 6 8 99 1 0 16 10 2
			£ 775 17 10
49.	*s.* 2	$\frac{1}{10}$	63,2
			£ 63 4 0
50.	*d.* 2	$\frac{1}{120}$	220,1—41
	¼	$\frac{1}{8}$	18 6 10
			£ 2 5 10¼
51.	*d.* 3	$\frac{1}{80}$	811,0—30
	¾	¼	101 7 6
			£ 25 6 10½
52.	*d.* 15	$\frac{1}{16}$	8117—5
	1¼	$\frac{1}{12}$	507 6 3
			£ 42 5 6¼
53.	*d.* 2	$\frac{1}{120}$	286,3—103
	¼	$\frac{1}{8}$	23 17 2 2 19 7¾
			£ 20 17 6¼

54.	d. 2	$\frac{1}{120}$	155,2—112	60.	d. 6	$\frac{1}{40}$	23,8—38
	¼	⅛	12 18 8 1 12 4		¾	⅛	5 19 0 0 14 10½
			£ 14 11 0				£ 5 4 1½
55.	d. 3	$\frac{1}{80}$	116,0—40	61.	d. 3	$\frac{1}{80}$	111,7—77
	¼	$\frac{1}{12}$	14 10 0 1 4 2		2 ¾	$\frac{1}{120}$ ¼	13 19 3 9 6 2 3 9 9¾
			£ 13 5 10				£ 26 15 2¾
56.	d. 3	$\frac{1}{80}$	91,3—33	62.	d. 3	$\frac{1}{80}$	271,0—70
	¼	$\frac{1}{12}$	11 8 3 0 19 0¼		3 ¼	$\frac{1}{80}$ $\frac{1}{12}$	33 17 6 33 17 6 2 16 5½
			£ 12 7 3¼				£ 70 11 5½
57.	d. 3	$\frac{1}{80}$	108,1—41	63.	d. 6	$\frac{1}{40}$	41,3—13
	¾	¼	13 10 3 3 7 6¾		¾	⅛	10 6 6 1 5 9¾
			£ 16 17 9¾				£ 11 12 3¾
58.	d. 3	$\frac{1}{80}$	100,1—41	64.	d. 6	$\frac{1}{40}$	213,6—16
	1 ¼	⅓ ¼	12 10 3 4 3 5 1 0 10¼		1 ¼	⅙ ¼	53 8 0 8 18 0 2 4 6
			£ 17 14 6¼				£ 64 10 6
59.	d. 3	$\frac{1}{80}$	311,1—71	65.	d. 6	$\frac{1}{40}$	134,2—22
	1 ¾	⅓ ¼	38 17 9 12 19 3 9 14 5¼		1 ¾	⅙ ⅛	33 11 0 5 11 10 4 3 10½
			£ 61 11 5¼				£ 43 6 8½

	d.		
66.	6	1/40	515,5—35
	2	⅓	128 17 6
	¼	⅛	42 19 2
			5 7 4¾
			£ 177 4 0¾
	d.		
67.	6	1/40	161,0—10
	2	⅓	40 5 0
	¾	⅛	13 8 4
			5 0 7½
			£ 58 13 11½
	d.		
68.	6	1/40	19,1—31
	3	½	4 15 6
	¼	1/12	2 7 9
			0 3 11¾
			£ 7 7 2¾
	d.		
69.	6	1/40	171,4—34
	3	½	42 17 0
	¾	¼	21 8 6
			5 7 1½
			£ 69 12 7½
	d.		
70.	8	1/30	10,4--14
	2	¼	3 9 4
	¼	⅛	0 17 4
			0 2 2
			£ 4 8 10
	d.		
71.	6	1/40	900,0
	4	1/60	225 0 0
	¾	⅛	150 0 0
			28 2 6
			£ 403 2 6

	d.		
72.	8	1/30	406,3—13
	3	1/80	135 8 8
	¼	1/12	50 15 9
			4 4 7¾
			£ 190 9 0¾
	d.		
73.	8	1/30	515,4—24
	3	1/80	171 16 0
	¾	¼	64 8 6
			16 2 1½
			£ 252 6 7½
	d.		
74.	8	1/30	131,3—23
	4	½	43 15 4
	¼	1/16	21 17 8
			1 7 4¼
			£ 67 0 4¼
	d.		
75.	6	1/40	123,4—34
	6	1/40	30 17 0
	¾	⅛	30 17 0
			3 17 1½
			£ 65 11 1½
	d.		
76.	1	1/12	345
	¼	¼	28 9
			7 2¼
		20	38,0 11¼
			£ 19 0 11¼
	d.		
77.	15	1/16	987—11
	1¼	1/12	61 13 9
			5 2 9¼
			£ 56 10 11¼

	d.		£	s.	d.
78.	15	$\frac{1}{16}$	654—14		
	$\frac{3}{4}$	$\frac{1}{20}$	40	17	6
			2	0	10½
			£38	16	7½
	d.				
79.	15	$\frac{1}{16}$	321—1		
	$\frac{1}{4}$	$\frac{1}{60}$	20	1	3
			0	6	8¼
			£ 19	14	6¾
	d.				
80.	15	$\frac{1}{16}$	11310—14		
	$\frac{1}{4}$	$\frac{1}{60}$	706	17	6
			11	15	7½
			£718	13	1½
	d.				
81.	15	$\frac{1}{16}$	233—9		
	$\frac{3}{4}$	$\frac{1}{20}$	14	11	3
			0	14	6¾
			£ 15	5	9¾
	d.				
82.	15	$\frac{1}{16}$	1900—12		
	1¼	$\frac{1}{12}$	118	15	0
			9	17	11
			£ 128	12	11
	d.				
83.	15	$\frac{1}{16}$	1018—10		
	1½	$\frac{1}{10}$	63	12	6
	¼	$\frac{1}{6}$	6	7	3
			1	1	2½
			£ 71	0	11½

	d.		£	s.	d.
84.	16	$\frac{1}{15}$	435		
	1	$\frac{1}{16}$	29	0	0
	¼	¼	1	16	3
			0	9	0¾
			£ 31	5	3¾
	d.				
85.	15	$\frac{1}{16}$	4134—6		
	2½	$\frac{1}{6}$	258	7	6
	¼	$\frac{1}{10}$	43	1	3
			4	6	1½
			£ 305	14	10½
	d.				
86.	16	$\frac{1}{15}$	586—1		
	2	$\frac{1}{8}$	39	1	4
	¼	$\frac{1}{8}$	4	17	8
			0	12	2½
			£ 44	11	2½
	d.				
87.	15	$\frac{1}{16}$	6183—7		
	3	$\frac{1}{5}$	386	8	9
	¾	¼	77	5	9
			19	6	5¼
			£ 483	0	11¼
	d.				
88.	16	$\frac{1}{15}$	437--2		
	3	$\frac{1}{80}$	29	2	8
	¼	$\frac{1}{12}$	5	9	3
			0	9	1¼
			£35	1	0¼
	d.				
89.	20	$\frac{1}{12}$	174—6		
	¼	$\frac{1}{80}$	14	10	0
			0	3	7½
			£ 14	6	4½

90.	d. 20	1/12	146—2
	¼	1/80	12 3 4
			0 3 0½
			£ 12 6 4½
91.	d. 20	1/12	156
	½	1/40	13 0 0
	¼	½	0 6 6
			0 3 3
			£ 13 9 9
92.	d. 20	1/12	177—9
	1¼	1/16	14 15 0
			0 18 5¼
			£ 15 13 5¼
93.	d. 15	1/16	201—9
	6	1/40	12 11 3
	¾	1/8	5 0 6
			0 12 6¾
			£ 18 4 3¾
94.	d. 20	1/12	731—11
	2	1/10	60 18 4
	¼	1/8	6 1 10
			0 15 2¾
			£ 67 15 4¾
95.	d. 16	1/15	490—10
	6	1/40	32 13 4
	¾	1/8	12 5 0
			1 10 7½
			£ 46 8 11½
96.	d. 20	1/12	9114—6
	3	1/80	759 10 0
	¼	1/12	113 18 6
			9 9 10½
			£ 882 18 4½
97.	d. 20	1/12	419—11
	3	1/80	34 18 4
	¾	¼	5 4 9
			1 6 2¼
			£ 41 9 3¼
98.	d. 20	1/12	971—11
	5	¼	80 18 4
			20 4 7
			£ 101 2 11
99.	s. 2	1/10	524
	d. 3	1/8	52 8 0
			6 11 0
			£ 58 19 0
100.	s. d. 2 6	1/8	418—2
	d. 1	1/30	52 5 0
			1 14 10
			£ 50 10 2
101.	s. d. 2 6	1/8	127—7
			£ 15 17 6
102.	s. d. 2 6	1/8	221—5
	d. 2½	1/12	27 12 6
			2 6 0½
			£ 29 18 6½

103.	s. d. 2 6 d. 5	⅛ ⅙	313—1 39 2 6 6 10 5 £ 45 12 11
104.		 2,0	545 3 163,5 £ 81 15 0
105.	s. 2 d. 15 ¾	1/10 1/16 1/20	210 21 0 0 13 2 6 0 13 1½ £ 34 15 7½
106.	s. d. 3 4 d. 3	⅙ 1/80	183—3 30 10 0 2 5 9 £ 32 15 9
107.	s. d. 2 6 1 3 ¾	⅛ ½ 1/20	1781—5 222 12 6 111 6 3 5 11 3¾ £ 339 10 0¾
108.	s. 4 d. 2	⅕ 1/120	310 62 0 0 2 11 8 £ 59 8 4
109.			2181 2=½ of 4s. £ 436 4 0
110.	s. 4 d. 4 1	⅕ 1/60 ¼	818—3 163 12 0 13 12 8 3 8 2 £ 180 12 10
111.	s. 5 d. 5	¼ 1/12	161—1 40 5 0 3 7 1 £ 36 17 11
112.	s. 4 d. 8	⅕ ⅙	2611—1 522 4 0 87 0 8 £ 609 4 8
113.	s. 5 d. 2	¼ 1/30	174—2 43 10 0 1 9 0 £ 42 1 0
114.	s. 5	¼	1143—3 £ 285 15 0
115.	s. 5 d. 1	¼ 1/60	745—1 186 5 0 3 2 1 £ 189 7 1

116.	*s.* 5 *d.* $7\frac{1}{2}$	$\frac{1}{4}$ $\frac{1}{8}$	209—1 52 5 0 6 10 $7\frac{1}{2}$ £ 58 15 $7\frac{1}{2}$
117.	*s.* 5 *d.* 10 $\frac{1}{4}$	$\frac{1}{4}$ $\frac{1}{6}$ $\frac{1}{40}$	234—2 58 10 0 9 15 0 0 4 $10\frac{1}{2}$ £ 68 9 $10\frac{1}{2}$
118.			194 3 = $\frac{1}{2}$ of 6s. £ 58 4 0
119.	*s. d.* 6 8 *d.* 3	$\frac{1}{3}$ $\frac{1}{80}$	707 235 13 4 8 16 9 £ 226 16 7
120.	*s. d.* 6 8	$\frac{1}{3}$	716—2 £ 238 13 4
121.		2,0	153 7 107,1 £ 53 11 0
122.	*s. d* 6 8 *d.* 5	$\frac{1}{3}$ $\frac{1}{16}$	511—1 170 6 8 10 12 11 £ 180 19 7

123.	*s. d.* 2 6	$\frac{1}{8}$	273 3 819 £ 102 7 6
124.	*s. d.* 6 8 *s.* 1 $\frac{3}{4}$	$\frac{1}{3}$ $\frac{1}{20}$ $\frac{1}{16}$	237 79 0 0 11 17 0 0 14 $9\frac{3}{4}$ £ 91 11 $9\frac{3}{4}$
125.	*s. d.* 6 8 1 3	$\frac{1}{3}$ $\frac{1}{16}$	401—2 133 13 4 25 1 3 £ 158 14 7
126.			137 4 = $\frac{1}{2}$ of 8s £ 54 16 0
127.	*d.* 3	$\frac{1}{32}$	239 4 = $\frac{1}{2}$ of 8s 95 12 0 2 19 9 £ 98 11 9
128.	*s.* 10 *s. d.* 1 3	$\frac{1}{2}$ $\frac{1}{8}$	1144 572 0 0 71 10 0 £ 500 10 0
129.	*s.* 10 *d.* 8	$\frac{1}{2}$ $\frac{1}{15}$	315 157 10 0 10 10 0 £ 147 0 0

130.	s. 10 d. 2	$\frac{1}{2}$ $\frac{1}{60}$	148 74 0 0 1 4 8 £ 72 15 4
131.	s. 10	$\frac{1}{2}$	2211 £ 1105 10 0
132.	s. 10 d. 7$\frac{1}{2}$ $\frac{1}{4}$	$\frac{1}{2}$ $\frac{1}{16}$ $\frac{1}{30}$	166 83 0 0 5 3 9 0 3 5$\frac{1}{2}$ £ 88 7 2$\frac{1}{2}$
133.	s. 10 d. 10	$\frac{1}{2}$ $\frac{1}{12}$	902 451 0 0 37 11 8 £ 488 11 8
134.	s. 10 1	$\frac{1}{2}$ $\frac{1}{10}$	666 333 0 0 33 6 0 £ 366 6 0
135.	d. 3	$\frac{1}{80}$	173 6=$\frac{1}{2}$ of 12s 103 16 0 2 3 3 £ 101 12 9
136.			796 6=$\frac{1}{2}$ of 12s £ 477 12 0
137.	s. 10 s. d. 2 6 1d.	$\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{30}$	344 172 0 0 43 0 0 1 8 8 £ 216 8 8
138.	s. 10 s. d. 3 4 d. 1	$\frac{1}{2}$ $\frac{1}{6}$ $\frac{1}{40}$	912 456 0 0 152 0 0 3 16 0 £ 611 16 0
139.	s. d. 1 8 d. 3	$\frac{1}{12}$ $\frac{1}{80}$	1308 6=$\frac{1}{2}$ of 12s 784 16 0 109 0 0 16 7 0 £ 910 3 0
140.	d. 3	$\frac{1}{80}$	185 7=$\frac{1}{2}$ of 14s 129 10 0 2 6 3 £ 131 16 3
141.	s. 5	$\frac{1}{4}$	237 59 5 0 £ 177 15 0
142.	s. d. 1 4	$\frac{1}{15}$	301 7=$\frac{1}{2}$ of 14s 210 14 0 20 1 4 £ 230 15 4

143.			677 8=½ of 16s £ 541 12 0	150.	*s. d.* 1 8	1/12	430 35 16 8 £ 394 3 4
144.	*s. d.* 3 4	⅙	679 113 3 4 £ 565 16 8	151.	*s. d.* 1 3	1/16	196 12 5 0 £ 183 15 0
145.	1½	⅛ 2,0	321 17 5457 40 1½ 541,6 10½ £ 270 16 10½	152.	*s. d.* 1 8 *d.* ½	1/12 1/40	797 9=½ of 18s 717 6 0 66 8 4 1 13 2½ £ 785 7 6½
146.		2,0	512 17 870,4 £ 435 4 0	153.	*s.* 4	⅕	979 195 16 0 £ 1174 16 0
147.	*s. d.* 2 6	⅛	979 122 7 6 £ 856 12 6	154.	*s. d.* 6 8 6d.	⅓ 1/40	136 45 6 8 3 8 0 £ 184 14 8
148.	*s. d.* 1 4 3d. ¼	1/15 1/80 1/12	256 8=½ of 16s 204 16 0 17 1 4 3 4 0 0 5 4 £ 225 6 8	155.	*s.* 10 *s. d.* 1 3	½ ⅛	1113 556 10 0 69 11 3 £ 1739 1 3
149.			395 9=½ of 18s £ 355 10 0	156.	*s.* 10 5 6d.	½ ½ ⅒	5325 2662 10 0 1331 5 0 133 2 6 £ 9451 17 6

157.	s. 2	$\frac{1}{10}$	1431		
			2		
			2862		
			143	2	0
			£ 2718	18	0
158.	s. d. 2 6	$\frac{1}{8}$	6431		
	d.		6431		
	7½	$\frac{1}{4}$	803	17	6
			200	19	4½
			£ 13866	16	10½
159.			173		
			2		
	s. 8	$\frac{1}{5}$	346		
			69	4	0
			£ 415	4	0
160.			5714		
			2		
	s. 8	$\frac{1}{5}$	11428		
	s.		2285	12	0
	8	$\frac{1}{5}$	2285	12	0
	6d.	$\frac{1}{40}$	142	17	0
			£ 16142	1	0
161.			713		
			73		
			2139		
			4991		
		2,0	5204,9		
			£ 2602	9	0

162.	d. 4	$\frac{1}{60}$	465		
			4		
			1860		
			7	15	0
			£ 1867	15	0
163.			391		
			5		
			£ 1955	0	0
164.	s. 5	$\frac{1}{4}$	982		
			8		
			7856		
			245	10	0
			£ 7610	10	0
165.			372		
			9		
	s. 9	$\frac{1}{20}$	3348		
	s. d.		167	8	0
	2 6	$\frac{1}{8}$	46	10	0
			£ 3561	18	0
166.			1353		
			13		
			£ 17589	0	0
167.	s. 4	$\frac{1}{5}$	185		
			18		
			3330	0	0
			37	0	0
			£ 3293	0	0
168.	d. 3	$\frac{1}{80}$	617		
			20		
			12340	0	0
			7	14	3
			£ 12332	5	9

169.	s. d. 2 6	$\frac{1}{8}$	371	
	d. 1	$\frac{1}{30}$	46 7 6	£ s. d.
			1 10 11	2) 0 2 7
			0 1 3½ = ½	0 1 3½
			£ 47 19 8½	
170.			1197	
			2	
	s. 8	$\frac{1}{5}$	2394 0 0	
	1s.	$\frac{1}{8}$	478 16 0	£ s. d.
	2d.	$\frac{1}{6}$	59 17 0	4) 2 9 2
			9 19 6	
			0 12 3½ = ¼	0 12 3½
			£ 2943 4 9½	
171.			1617	
			6	£ s. d.
	s. 6	$\frac{1}{20}$	9702 0 0	4) 6 6 6
	6d.	$\frac{1}{40}$	485 2 0	1 11 7½
			40 8 6	
			4 14 10½ = ¾	4 14 10½
			£ 10232 5 4½	
172.			394	£ s. d.
			7 = ½ of 14s.	0 14 0
				5
			275 16 0	
			0 8 9 = ⅝	8) 3 10 0
			£ 276 4 9	0 8 9
173.	s. d. 2 6	$\frac{1}{8}$	9495	
			1186 17 6	
	d. 3	$\frac{1}{80}$	8308 2 6	£ s. d.
	½	$\frac{1}{6}$	118 13 9	8) 0 17 9½
			19 15 7½	0 2 2½ ¾
			0 15 6¾ ¼	0 15 6¾ ¼
			£ 8447 7 5¼ ¼	

174.			264	
			3	£ s. d.
	s.			3 14 10
	12	⅕	792 0 0	5
	s. d.		158 8 0	
	2 6	⅛	33 0 0	9) 18 14 2
	4d.	1/60	6 8 0	
			2 1 6¾ (5) = 5/9	2 1 6¾ (5)
			£ 981 17 6¾ (5)	
	s. d.			
175.	3 4	⅙	6616	£ s. d.
			7 = ½ of 14s.	0 17 4½
				3
	d.		4631 4 0	
	½	1/80	1102 13 4	4) 2 12 1½
			13 15 8	
			0 3 3(6) = 8/16	4) 0 13 0¼—2 } 6
				0 3 3 —1 }
			£ 5747 16 3 (6)	
	s.			
176.	4	⅕	454	
	d.			£ s. d.
	6	⅛	90 16 0	12) 0 4 6
			11 7 0	0 0 4½
			0 4 1½ = 1½	
				0 4 1½
			£ 102 7 1½	
	s. d.			
177.	3 4	⅙	838	£ s. d.
	d.			0 3 8
	4	1/60	139 13 4	7
			13 19 4	
			0 2 6¾ (2) = 7/10	10) 1 5 8
			£ 153 15 2¾ (2)	0 2 6¾ (2)
	s.			
178.	5	¼	1591	
			4	£ s. d.
				4 7 0
			6364 0 0	2
	s.		397 15 0	
	2	1/10	159 2 0	5) 8 14 0
			1 14 9½ (2) = ⅖	
				1 14 9½ (2)
			£ 6922 11 9½ (2)	

WEIGHTS AND MEASURES.

179.	*qr.*		£	*s.*	*d.*
	2	½	2	16	6
					12
	qr.		33	18	0
	1	½	1	8	3
			0	14	1½
			36	0	4½
180.	*qr.*		£	*s.*	*d.*
	2	½	1	17	4
					5
			9	6	8
	lb.		0	18	8
	16	⅐	0	5	4
			10	10	8
181.	*qr.*		£	*s.*	*d.*
	1	¼	2	17	1
					7
			19	19	7
	lb.		0	14	3¼
	7	¼	0	3	6¾ (1)
			20	17	5 (1)
182.	*lb.*		£	*s.*	*d.*
	8	1/14	2	13	8
			0	3	10
			2	17	6
183.	*lb.*		£	*s.*	*d.*
	16	⅐	3	19	2¼
					4
			15	16	9
			0	11	3¾
			15	5	5¼

184.	*qr.*		£	*s.*	*d.*
	2	½	4	11	3½
					2
			9	2	7
	lb.		2	5	7¾
	16	⅐	0	13	0½
	2lb.	⅛	0	1	7½ (2)
			12	2	10¾ (2)
185.	*qr.*		£	*s.*	*d.*
	1	¼	4	5	9
					9
			38	11	9
	lb.		1	1	5¼
	8	1/14	0	6	1½
	4lb.	½	0	3	0¾
			40	2	4½
186.	*qr.*		£	*s.*	*d.*
	2	½	1	10	8
	lb.				
	3½	1/16	0	15	4
			0	0	11½
			0	16	3½
187.	*qr.*		£	*s.*	*d.*
	2	½	0	14	7
	qr.				
	1	½	0	7	3½
	7lb.	¼	0	3	7¾
	4lb.	⅐	0	0	10¾ (3)
			0	0	6¼
			0	12	4¼ (3)
188.	*lb.*		£	*s.*	*d.*
	16	⅐	23	2	0
	lb.				
	7	1/16	3	6	0
			1	8	10½
			4	14	10½

			£	s.	d.		
189.	*qr.*		£	*s.*	*d.*		
	2	½	0	15	5½		
					4		
	qr.		3	1	10		
	1	½	0	7	8¾		
	lb.		0	3	10¼	—1	The exact answer, as found by the Rule of Three, is £3 14 $8\frac{1}{4}\frac{25}{32}$
	8	$\frac{1}{14}$	0	1	1¼		
	1	⅛	0	0	1½	—5	
	¼	¼	0	0	0¼	—2	
			3	14	8		
190.	*qr.*		£	*s.*	*d.*		
	1	¼	0	12	9		
					11		
			7	0	3		
	lb.		0	3	2¼		
	8	$\frac{1}{14}$	0	0	10¾	(10)	
	14lb	⅛	0	1	7	(4)	The exact answer, as found by the Rule-of-Three, is £7 6 $4\frac{1}{4}\frac{79}{112}$
	of 14lb 3½ is	¼	0	0	4¾		
	of 3½lb ¼ is	$\frac{1}{14}$	0	0	0¼	(5)	
			7	6	4		
	s.						
191.	5	¼	138				
			4				
			552	0	0		
			34	10	0		
			£ 586	10	0		
192.			£	*s.*	*d.*		
			7	7	10½		
					10		
			73	18	9		
					7		
	qr.		517	11	3		
	1	¼	7	7	10½	once first line	
	14lb	½	1	16	11½	(2)	
			0	18	5¾		
			527	14	6¾		

193.			13 13 13 1354	
	d. 15	$\frac{1}{16}$	1510 lb.	
	d. $\frac{1}{4}$	$\frac{1}{60}$	94 7 6 1 11 5½	
			£ 95 18 11½	
194.			211 211 211 21117	
	s. d. 3 4	$\frac{1}{6}$	23649 lb.	
	d. 4	$\frac{1}{10}$	3941 10 0 394 3 0	
			£ 4335 13 0	
195.	*lb.* 14	$\frac{1}{8}$	£ *s.* *d.* 5 13 4 5	4) 2822—2 }
			28 6 8 5	7) 705—5 } 22
	lb. 8	$\frac{1}{14}$	141 13 4 0 14 2 0 8 1 (2)	4) 100 25 cwt. 22 lb.
			142 15 7	
196.	*dwt.* 10	$\frac{1}{2}$	£ *s.* *d.* 40 6 2 3	
	qr. 1	$\frac{1}{40}$	120 18 6 20 3 1 0 10 0¾ (28)	
			141 11 7¾	

			T. cwt. qr. lb.
			(17 2 3 12 at £9. per Ton)
197.			£ s. d.
			9 0 0
			17
	cwt. qr. lb.		153 0 0
	2 3 12	$\frac{1}{7}$	1 5 8$\frac{1}{2}$ (2)
			154 5 8$\frac{1}{2}$
			£ s. d.
198.			0 1 10
			9
	oz.		0 16 6
	4	$\frac{1}{4}$	0 0 5$\frac{1}{2}$
	2oz.	$\frac{1}{2}$	0 0 2$\frac{3}{4}$
			0 17 2$\frac{1}{4}$
			lb. oz. dwt.
			(217 3 12 at 10s. 1d. per .b.)
199.			217
			10
			2170
	1d.	$\frac{1}{12}$	18 1
	3oz.	$\frac{1}{4}$	2 6$\frac{1}{4}$
	12dwt.	$\frac{1}{5}$	0 6 (1)
		20	2191 1$\frac{1}{4}$
			109 11 1$\frac{1}{4}$
200.			£ s. d.
			2 4 6
			9
			20 0 6
			9
			180 4 6
	3oz.	$\frac{1}{4}$	0 11 1$\frac{1}{2}$
	2oz.	$\frac{1}{6}$	0 7 5
	10dwt.	$\frac{1}{4}$	0 1 10$\frac{1}{4}$
			181 4 10$\frac{3}{4}$

	dwt.		£	s.	d.
201.	10	½	4	0	0
					4
	dwt.		16	0	0
	5	½	2	0	0
	4 gr.	1/30	1	0	0
	1 gr.	¼	0	0	8
			0	0	2
			19	0	10
	qr.		£	s.	d.
202.	2	½	0	5	4
					5
	nl.		1	6	8
	1	⅛	0	2	8
			0	0	4
			1	9	8
	qr.		£	s.	d.
203.	1	¼	0	2	2
					7
			0	15	2
					3
	nl.		2	5	6
	2	½	0	0	6½
	1 nl.	½	0	0	3¼
			0	0	1½ (1)
			2	6	5¼
	nl.		£	s.	d.
204.	2	⅛	0	15	10
			0	1	11¾ Ded.
			0	13	10¼
	qr.nl.		£	s.	d.
205.	1 1	¼	0	16	2¼
					10
			8	1	10½
			0	4	0½ (1)
			8	5	11

	gal.		£	s.	d.
206.	6	⅛	0	13	6
					7
			4	14	6
			0	2	3
			4	16	9
	pt.		£	s.	d.
207.	4	½	0	0	10
					11
	pt.		0	9	2
	1	¼	0	0	5
			0	0	1¼
			0	9	8¼
	rd.		£	s.	d.
208.	1	¼	1	7	7
					9
			12	8	3
					3
	pl.		37	4	9
	5	⅛	0	6	10¾
			0	0	10¼ (3)
			37	12	6
	pl.		£	s.	d.
209.	16	1/16	1	17	3½ ×14
					7
			13	1	0½
					2
			26	2	1
			0	3	8¾ Ded
			25	18	4¼

			£	s.	d.	
210.	s. d. 1 4	$\frac{1}{15}$	921			
			61	8	0	
			859	12	0	
			0	2	4	= 20 pl.
			0	1	10¼ (6)	= 16 pl.
			£ 859	16	2¼	

pl.
20 = ⅛
16 = $\frac{1}{10}$

£	s.	d.
0	18	8
0	2	4
0	1	10¼ (6)

CHEESE AND SOAP.

			£	s.	d.
211.	qr. 1	¼	2	7	0
	15lb	½	0	11	9
			0	5	10½
			3	4	7½

			£	s.	d.
212.	qr. 1	¼	2	1	6
					4
			8	6	0
	lb. 10	⅛	0	10	4½
			0	3	5½
			8	19	10

			£	s.	d.
213.	qr. 1	¼	3	12	0
					2
			7	4	0
	lb.		0	18	0
	20	⅙	0	12	0
	3lb.	$\frac{1}{40}$	0	1	9½ (16)
			8	15	9½

			£	s.	d.
214.	lb. 24	⅕	2	2	6
			0	8	6
			2	11	0

			£	s.	d.
215.	qr. 2	½	2	4	6
	1qr.	½	1	2	3
	lb.		0	11	1½
	1	$\frac{1}{28}$	0	0	4¼ (24)
			3	18	2¾

			£	s.	d.
216.	qr. 2	½	3	6	6
					7
			23	5	6
	lb. 15	¼	1	13	3
	lb.		0	8	3¾
	4	$\frac{1}{28}$	0	2	2½ (12)
			25	9	3¼

TARE AND TRET.

CASE I.

1\.

cwt.	*qr.*	*lb.*	
19	3	11	Gross.
2	1	17	Tare.
17	1	22	Neat.

2\.

cwt.	*qr.*	*lb.*	
489	3	5	Gross.
14	0	26	Tare.
475	2	7	Neat.

3\.

16
16
16
1656

1848 lb. Gross.
65 Tare.

d.		
6	$\frac{1}{40}$	1783 lb. Neat.
3	$\frac{1}{2}$	44 11 6
$\frac{1}{2}$	$\frac{1}{6}$	22 5 9
		3 14 $3\frac{1}{2}$
		£ 70 11 $6\frac{1}{2}$

CASE II.

4\.

cwt.	*qr.*	*lb.*	
10	1	9	Gross.
0	3	15	Tare.
9	1	22	Neat of 1 hhd.
		7	
66	0	14	Neat of 7 hhd.

5\.

lb.
237 Gross.
19 Tare.

218 Neat of 1 bale.
11

2398
5

11990 Neat of 55 bales.

6\.

24
24
24
2456

2744 lb. Gross.
98 Tare.

2646 Neat of 1 bag.
37

18522
7938

d.		
1	$\frac{1}{12}$	97902 lb. Nt. of 37 bags
$\frac{1}{4}$	$\frac{1}{4}$	8158 6
		2039 $7\frac{1}{2}$
	2,0	10810,0 $1\frac{1}{2}$
		£ 5405 0 $1\frac{1}{2}$

CASE III.

7.

	cwt.	*qr.*	*lb.*		*lb.*	
No. 1.	2	3	13	Gross.	17	Tare.
No. 2.	3	0	7	——	20	——
No. 3.	3	1	16	——	22	——
No. 4.	5	1	20	——	31	——
	14	3	0	Gross.	90	Tare.
	0	3	6	Tare.		
	13	3	22	Neat.		

8.

	cwt.	*qr.*	*lb.*	
No. 1.	3	0	27	
No. 2.	5	3	8	
No. 3.	2	1	19	
No. 4.	1	2	3	
	13	0	1	Gross.
	2	0	3	Tare.
	10	3	26	Neat.

9.

	cwt.	*qr.*	*lb.*	
No. 1.	5	3	17	
No. 2.	5	0	27	
No. 3.	5	1	26	
No. 4.	5	3	27	
No. 5.	5	2	0	
	28	0	13	Gross.
	4	1	24	Tare.
	23	2	17	Neat.

100
5
500lb. = 4 cwt. 1 qr. 24 lb.

		£	*s.*	*d.*	
qr.					
2	½	4	3	8	
				11	
		46	0	4	
				2	plus 1.
		96	4	4	
lb.		2	1	10	
16	$\frac{1}{7}$	0	11	11¼	(5)
1	$\frac{1}{16}$	0	0	8¾	(13)
		£98	18	10	

The exact answer to the above question, as found by the Rule-of-Three, is £98 18 10¼ (64)

CASE IV.

10.

		cwt.	*qr.*	*lb.*	
		17	1	14	Gross.
16lb.	$\frac{1}{7}$	2	1	26	Tare.
		14	3	16	Neat.

11.

		cwt.	*qr.*	*lb.*	
		2	1	18	
				7	
		16	3	14	
				3	
14lb	⅛	50	2	14	Gross.
		6	1	8¾	Tare.
		44	1	5¼	Neat.

12.

	cwt.	qr.	lb.	
	504	2	7	Gross.
	18	0	2¼	Tare.
	486	2	4¾	Neat.

4lb. = $\frac{1}{28}$ of 1 cwt.

4) 504 2 7

7) 126 0 15¾

18 0 2¼

lb. £ s. d. cwt. qr. lb.

112 —— 5 9 3 —— 486 2 4¾

4

448

5 9 3

20

109

12

1311

486

486

486

48660

54492¾

4

217971

1311

2397681 = 11 times.

2833623 = 1300 times.

448 = 2 × 4 × 7 × 8

2) 285759981—1

4) 142879990—2 } 5

7) 35719997—5

8) 5102856—0 } 5

} 45 rem.

12) 637857—9

2,0) 5315,4

£ 2657 14 9 (45)

The 3 divisors, 7, 8, 8, might have been used. The 4 divisors, 2, 4, 7, 8, are merely made use of to shew how the whole remainder may be determined, when there are four divisors, being 8 times 5, plus 5.

13.

	cwt.	qr.	lb.
No. 1.	3	0	17
No. 2.	2	3	0
No. 3.	4	0	11
	10	0	0

lb.

18

10

180

10 0 0

10

10

10

1120 lb. Gross.

180 Tare.

940 lb. Neat.

4

3,0) 376,0

125 gal. (10 rem.)

```
14.        lb.           lb.        lb.         lb.
           364           112————————10————————2548
             7                                  10
         ————                               ——————
          2548  Gross.                112 ) 25480 ( 227½
          227½  Tare.                       224
         —————                              ———
          2320½ Neat.                        308
             4                               224
         —————                               ———
   3,0 ) 928,2—12                             840
         ———                                  784
          309 gal. (12)                       ———
         ═════                                 56
                                                4
                                              ———
                                              224
                                              224
                                              ═══
```

CASE V.

```
15.          cwt. qr.  lb.                      cwt. qr. lb.
               9   2   17 Gross.             2 ) 9   1    4
               0   1   13 Tare.                 ——————————
             ——————————                     13 ) 4   2   16
  4lb. | 1/26 | 9   1    4 Tare Suttle.         ——————————
              | 0   1   12 Tret.                 0   1   12
             ——————————                         ══════════
               8   3   20 Neat.
             ══════════


16.          cwt. qr. lb.                       cwt. qr. lb.
              97   1  17 Gross.              2 ) 95   2  16
               1   3   1 Tare.                  ——————————
             ——————————                     13) 47   3   8
              95   2  16 Tare Suttle.           ——————————
               3   2  20 Tret.                    3   2  20
             ——————————                         ══════════
              91   3  24 Neat.
              91
             91
            91
             108
           ————
           10300·lb.
           ═════
```

17.

cwt.	*qr.*	*lb.*	
2	0	16	
		7	
15	0	0	Gross.
2	1	10½	Tare.
12	2	17½	Tare Suttle.
0	1	26½	Tret.
12	0	19	Neat.

	cwt.	*qr.*	*lb.*
	0	0	17½ × 15
			5
	0	3	3½
			3
	2	1	10½
2)	12	2	17½
13)	6	1	8¾
	0	1	26½ (1) T.

CASE VI.

18.

cwt.	*qr.*	*lb.*	
9	2	15	Gross.
1	3	25	Tare.
7	2	18	Tare Suttle.
0	1	5	Tret.
7	1	13	Tret Suttle.
0	0	4¾	Clough.
7	1	8¼	Neat.

	cwt.	*qr.*	*lb.*	
2)	7	2	18	26 = 2 × 13
13)	3	3	9	
	0	1	5	
4)	7	1	13	168 = 4 × 6 × 7
6)	1	3	10¼	
7)	0	1	6¼ (5)	
	0	0	4¾ (4)	

19.

cwt.	*qr.*	*lb.*	
6	3	13	Gross.
0	2	11	Tare.
6	1	2	Tare Sut. of 1 Cask.
		4	
25	0	8	Tare Sut. of 4 Casks.
0	3	24	Tret.
24	0	12	Tret Suttle.
0	0	16	Clough.
23	3	24	Neat.

	cwt.	*qr.*	*lb.*	
2)	25	0	8	2 × 13 = 26
13)	12	2	4	
	0	3	24	
4)	24	0	12	168 = 4 × 6 × 7
6)	6	0	3	
7)	1	0	0½	
	0	0	16 (2)	

20.

cwt.	qr.	lb.	
66	0	13	Gross.
7	2	19½	Tare.
58	1	21½	Tare S.
2	0	27¾	Tret.
56	0	21¾	Tret S.
0	1	9¼	Clough.
55	3	12½	Neat.
55			
55			
5596½			

d.		
6	$\frac{1}{40}$	6256½ lb.

		£	s.	d.
1	$\frac{1}{6}$	156	8	0
¾	$\frac{1}{8}$	26	1	4
		19	11	0
		0	0	3¾ (1)=½ lb.
		£ 202	0	7¾

cwt.	qr.	lb.	
0	0	13	×66
		11	
1	1	3	
		6	
7	2	18	
		1½	Tare for 13lb.
7	2	19½	whole Tare.

lb. lb. lb.

112——13——13

13

112) 169 (1½

112

57

4

228

224

4

	cwt.	qr.	lb.	
2)	58	1	21½	
13)	29	0	24¾	
	2	0	27¾	Tret.
4)	56	0	21¾	Tret Suttle.
6)	14	0	5¼	
7)	2	1	10	
	0	1	9¼	Clough.

In finding the amount, we might have taken 6d.—$\frac{1}{40}$; 1½—¼; and ¾d.—⅛.

* * *

J. WRIGHT, PRINTER, MACCLESFIELD.